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CANADA

ENERGY SUPPLY and DEMAND in CANADA and EXPORT DEMAND for CANADIAN ENERGY

1966 to 1990

National Energy Board

Ottawa
1969


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Energy Supply and Demand in Canada and Export Demand for Canadian Energy 1966 to 1990

Prepared by the Staff
of the
NATIONAL ENERGY BOARD
Ottawa, Canada

1969

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LIST OF DEFINITIONS, ABBREVIATIONS AND HEAT VALUES

Definitions

Atlantic Provinces	—New Brunswick, Nova Scotia, Prince Edward Island and Newfoundland
Dual Fuel System	—a space-heating system designed to burn either gas or oil
Fuel Cell	—electrochemical devices that convert chemical energy directly into electrical energy
Frontier Areas	—the West Coast, the Arctic Islands and offshore, Hudson Bay, the Atlantic offshore, the Gulf of St. Lawrence and the Gaspé
Heavy Water	—water in which the hydrogen is entirely heavy-hydrogen having a mass number of 2 instead of 1. Also called deuterium oxide (D_2O)
Interruptible Service	—service supplied to a customer which may be interrupted at the discretion of the distributing company or under certain circumstances specified in the service contract
Lower "48" States	—Continental United States excluding Alaska
Liquefied Natural Gas	—the product of liquefaction of natural gas consisting mostly of methane in liquid form
Maritime Provinces	—New Brunswick, Nova Scotia, Prince Edward Island
Natural Gas Liquids	—liquid hydrocarbon mixtures recovered from natural gas during processing: includes natural gasoline, condensate and LPG's
Peak Shaving	—supplying gas to a system from an auxiliary source during periods of maximum demand
Prairie Provinces	—Alberta, Saskatchewan, Manitoba
United States PAD District	—Petroleum Area for Defence
West of Ottawa Valley	—that portion of Canada to be substantially supplied with products derived from Canadian crude oil under present national oil policy
Western Canada Sedimentary Basin	—the northern part of the great North American Interior Basin which runs from the Gulf of Mexico to the Beaufort Sea.

Abbreviations

Btu	—British Thermal Unit. The amount of heat equivalent to 251.996 IT (International Tables) calories or 778.26 foot-pounds
DBS	—Dominion Bureau of Statistics, Ottawa
DC Cables	—Direct current cables
GWH	—Gigawatthour—1,000,000 kilowatthours (KWH)
HFO	—Heavy fuel oil
LNG	—Liquefied natural gases
LPG	—Liquefied petroleum gases; propanes, butanes and propane—butane mixes
MBbls	—Thousands of barrels
MB/D	—Thousands of barrels per day

ABBREVIATIONS (Cont.)

MMB/D	—Millions of barrels per day
Mcf	—Thousands of cubic feet
MW	—Megawatt
NGL	—Natural gas liquids
N.W.T.	—Northwest Territories
Y.T.	—Yukon Territory

HEAT VALUES

Petroleum (Btu's per barrel)	*Btu's*
Liquid Propane	3,850,000
Liquid Butane	4,305,000
L.P.G. Average	4,000,000*
Aviation Gasoline	5,050,000*
Motor Gasoline	5,222,000*
Turbo Fuel	5,414,500*
Kerosene & Stove Oil	5,677,000*
Diesel & Light Fuel Oil	5,827,500*
Heavy Fuel Oil	6,293,000*
Pipe Line, Plant Fuel & Losses	5,827,500*
Natural Gas (Btu's per Mcf)	1,035,000
Natural Gas Forecast Period	1,000,000*
Electricity (Btu's per kwh of Use)	3,412
Hydro-Electricity (Btu's per kwh Output)	10,000*
Nuclear-Electricity (Btu's per kwh Output)	10,000*
Coal (Btu's per ton of 2,000 lbs.)	
Bituminous Coal	26,200,000*
Sub-bituminous Coal	19,000,000*
Lignite	14,000,000*

SOURCE: Interdepartment Advisory Committee on Energy Statistics, 1962, Mines and Technical Surveys.

*Heat Values used to determine Primary Energy Requirements for the forecast period.

NOTE: The following products or energy uses are considered as primary energy requirements:
Petroleum Fuels: L.P.G., Aviation gasoline, Turbo fuels, Motor gasoline, Kerosene and stove oil, Diesel fuel, Light fuel oil, Heavy fuel oil, and pipe lines, Refinery fuel and losses.
Natural Gas: Net Sales, pipe line fuel and losses, and field and plant use.
Coal and Coke: Domestic demand including losses in production.
Hydro-Electricity: Total hydro generation by industry and utilities plus 0.75 per cent of net generation for station service.
Thermal-Electricity: Total thermal generation by utilities plus 6.5 per cent of net generation for station service.

I commend the National Energy Board for its initiative in undertaking this long range energy forecast. Such forecasts, hazardous as they may be, can be highly valuable in assessing present energy policies and, if need be, in reviewing or replacing them. The publication of this study is particularly timely when energy policies on this continent are undergoing intense review.

The study deserves attention by government and industrial planners and managers concerned with the future of Canada's energy industries. Informed discussion will help all of us who are involved in such matters to aim our decisions toward the greatest benefit for Canada from its energy resources.

J. J. GREENE
Minister of Energy, Mines and Resources

I

INTRODUCTION

PURPOSE OF THE STUDY

This report presents the results of a National Energy Board staff study of energy supply and demand in Canada to 1990. The study covers all forms of energy in Canada, and probable sources of supply for serving both indigenous and export demand for Canadian energy.

The primary reason for undertaking the study was to identify developing energy trends in Canada as they become apparent and to assess their probable impacts over the forecast period. Such assessments are necessary for the effective discharge of the Board's statutory functions, including the determination of Canadian requirements and consequently any surpluses of natural gas and electricity in relation to applications for export licences. Such forecasts are also needed for the proper discharge of the other regulatory and advisory functions of the Board.

The report is published in the hope that it may be helpful to others interested in this subject. While authorizing the publication of this study, which has been prepared at its request, the Board does not accept responsibility for all of the statements and opinions that may be found in it.

PRESENTATION OF FINDINGS

Energy demand by market sector (residential and commercial, industrial, and transportation) is discussed in Chapters III, IV and V, respectively. Chapters VI, VII, VIII and IX deal with supply prospects for Canadian petroleum, natural gas, coal and electricity serving indigenous and export markets. A summary of the report is contained in Chapter II.

Appendix A reviews general assumptions including those relating to population and household growth. Appendix B summarizes the methodology used for estimating residential energy demand, automobile transportation energy demand, and electricity supply. Appendix C includes a number of

tables which provide more detailed information than is presented in the main body of the report. A list of definitions and abbreviations follows the Table of Contents.

THE METHODS AND DIFFICULTIES OF FORECASTING

Within the Canadian market there are alternative forms of energy available to supply the various sector demands. The share indicated herein for the respective fuels in the various market sectors are those which, on the basis of present knowledge, appear to represent the most likely future distribution. Exports of Canadian energy are presented in the form of specific estimates where these could be made. Where this was impracticable, assumptions were made as to the possible ranges of export demand.

The evaluation of production was based on methods which varied somewhat as between energy sources. The supply of electricity and coal was analyzed on a regional or provincial basis whereas natural gas and petroleum supplies needed a much more general approach.

Events presently unforeseen will no doubt bring about actual distributions different from those portrayed in this report. However, it is hoped that the study will contribute to informed discussion and analysis of the prospects for energy demand in Canada, and the opportunities for the development and use of Canadian energy resources in Canada and elsewhere.

The approach used in this study took into account both published and unpublished information available to the National Energy Board. In the course of preparing the demand and supply assessments, members of the National Energy Board staff discussed initial projections with representatives of a number of organizations including corporations, trade associations and agencies of provincial governments as well as other agencies of the Government of Canada involved in various aspects of the energy field. While it is not feasible to list all those who contributed knowledge and helpful criticism, their assistance is gratefully acknowledged.

II

SUMMARY AND CONCLUSIONS

The general assumptions used in this study are described in Appendix A. More specific assumptions are identified in relevant chapters.

ENERGY DEMAND IN CANADA

Total Canadian demand for energy is estimated to increase to 9,100 trillion Btu's by 1990 which is equivalent to an average annual growth rate of four per cent per year from 1966.

ENERGY DEMAND BY SECTOR[1]
(Trillions of Btu's)

Sector	Actual	Estimated	
	1966	1975	1990
Residential and Commercial	1,392	1,795	2,879
Industrial	1,240	1,861	3,516
Transportation	982	1,463	2,706
	3,614	5,119	9,101

[1] Excluding own uses and losses.

Over the forecast period, annual demand for electricity and natural gas will grow at higher rates than the four per cent for total energy; annual demand for oil will grow at a slower rate and that for coal will decline.

AVERAGE ANNUAL RATE OF GROWTH
(Per cent)

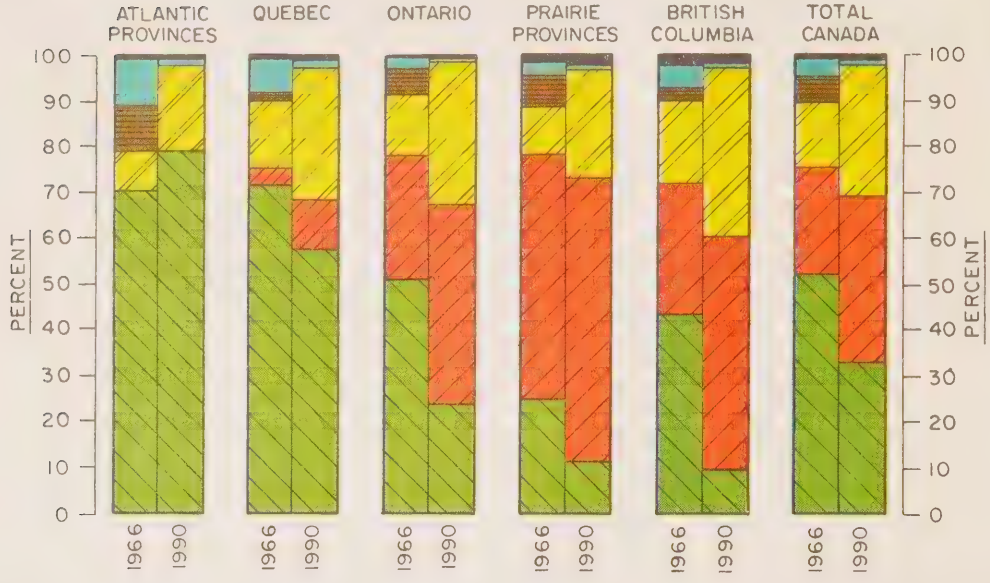
Electricity	6.0
Natural Gas	5.8
Oil	3.4
Coal	—0.6

FIGURE II — 1

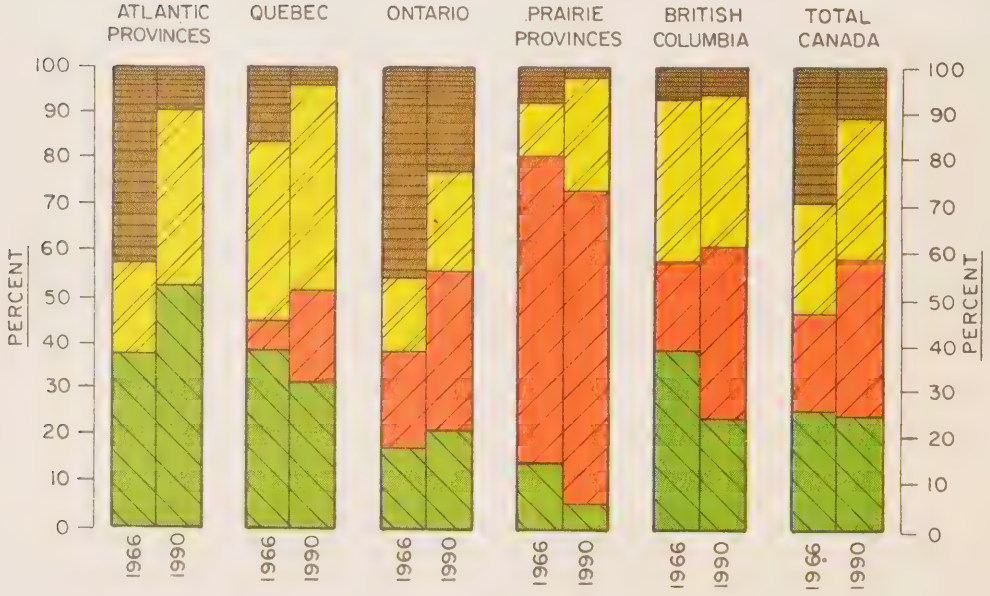
RELATIVE IMPORTANCE OF VARIOUS TYPES OF ENERGY BY SECTOR AND REGION

ACTUAL: 1966 ESTIMATED: 1990

RESIDENTIAL AND COMMERCIAL SECTOR



INDUSTRIAL SECTOR



LEGEND

OIL
NATURAL GAS
ELECTRICITY
COAL
WOOD
OTHER

SOURCE : APPENDIX C

Residential and Commercial Energy Demand in Canada (see Figure II-1).

- Oil will continue to be the most important single source of energy over the forecast period.
- Natural gas and electricity demand will increase in relative importance. By 1990, demand for these sources of energy will be close to the level of oil demand.

Industrial Energy Demand in Canada

- Natural gas, electricity and oil demand in Canada will increase substantially by 1990. Natural gas will become the most important single source of industrial energy. Coal demand will remain virtually unchanged.
- The relative importance of individual sources of energy will vary significantly from region to region (see Figure II-1).
- Non-energy use of petroleum constituted over eight per cent of total product sales in 1966. By 1990, such use is expected to increase to 13.5 per cent. Petrochemical feedstock will be the most important non-fuel product.

Transportation Energy Demand in Canada

- In 1966, nearly 99 per cent of energy demand in the transportation sector was supplied by petroleum fuel, the remainder from coal. By 1990, petroleum fuel will supply the total Canadian energy requirement of this sector.
- Motor gasoline will continue to be the dominant source of transportation energy requirements. By 1990, turbo fuel will be the second most important source.

TRANSPORTATION ENERGY REQUIREMENTS BY TYPE OF FUEL
(Millions of barrels)

	Actual	Estimated	
	1966	1975	1990
Motor Gasoline	136	202	339
Diesel Oil	21	31	57
Heavy Fuel Oil	11	14	18
Turbo Fuel	10	24	91
Aviation Gasoline	2	1	1

ENERGY SUPPLY IN CANADA

Petroleum Supply

Currently the Canadian Government is reviewing its policies relative to the importation of petroleum. Any changes in the existing policy will have an effect upon Canadian production for Canadian markets. The United States

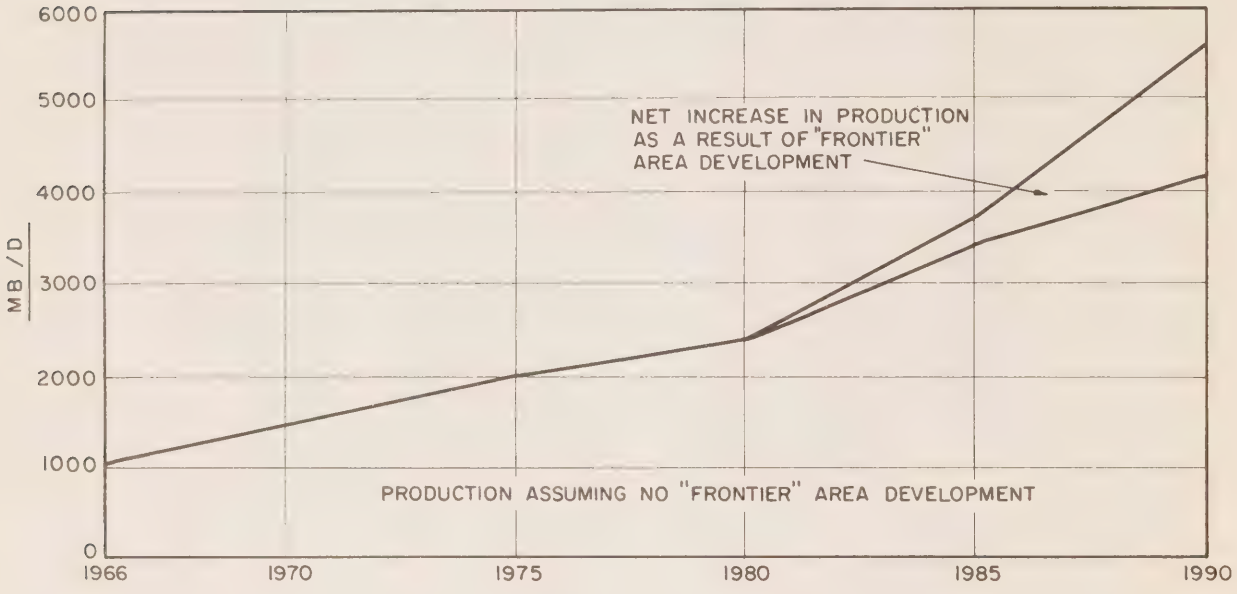
FIGURE II — 2

CANADIAN CRUDE OIL PRODUCTION

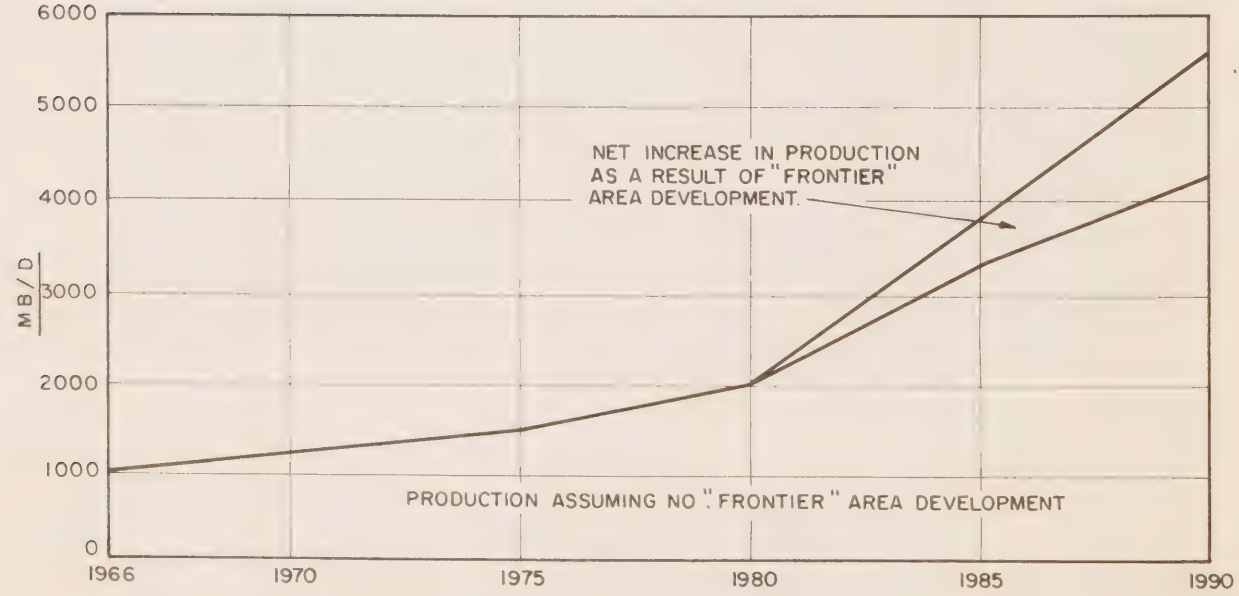
ACTUAL: 1966 ESTIMATED: 1975, 1980, 1985, 1990

(MB/D).

ASSUMING UNITED STATES PRODUCTION OF
11 MM B/D IN "LOWER-48"



ASSUMING UNITED STATES PRODUCTION OF
12 MM B/D IN "LOWER-48"



SOURCE: APPENDIX C

Government is also reviewing its policies regarding petroleum imports and supply arrangements. Future Canadian exports to the United States will be related to that country's import policies and production from domestic sources including Alaska. The recent emergence of the Alaska North Slope with reserves approaching those of the existing United States conventional industry complicates the assessment of the petroleum supply picture of North America in the near term (to 1975) although the long term situation is comparatively clear in its broad outlines.

- Petroleum markets available to Canadian production were calculated on the basis of:
  - three possible levels of petroleum imports into Canada ((i) continuation of the present policy, (ii) imports restricted to 17.3 per cent of total Canadian demand and (iii) imports restricted to ten per cent of total Canadian demand).
  - Alaska North Slope production beginning in 1972 and increasing alternatively to 1.0, 2.5 and 4.0 MMB/D
  - United States conventional production, excluding Alaska North Slope, peaking at 11.0 to 12.0 MMB/D
  - Continuation of non-Canadian imports into the United States at the 1968 level of 17.3 per cent of total United States demand.
- Calculations using these assessments clearly indicate a shortage of United States petroleum supply especially in the longer term. It was assumed that Canadian production would have an opportunity to share in supplying this shortage or gap on an equal basis with combined production from United States sources of synthetic or unconventional crude oil and additional imports from overseas.
- The resource potential for Canadian petroleum production was assumed on the basis of:
  - Case A — production restricted to the Western Canada Sedimentary Basin.
  - Case B — conventional production available from "frontier" areas, augmented if necessary, by significant additional Athabasca oil sands developments.
- Canadian petroleum production is shown in Figure II-2, based on an illustrative case of:
  - (i) Continued present Canadian import policy
  - (ii) Alaska North Slope production of 2.5 MMB/D, and
  - (iii) Other United States conventional production of 11.0 MMB/D and 12.0 MMB/D.

CANADIAN OIL PRODUCTION
(MB/D)

	Actual	Estimated	
	1966	1975	1990
Case A	1,013	1,950 to 1,450	4,100
Case B	1,013	1,950 to 1,450	5,500[2]

[2] The difference between Case A and Case B makes allowance for a reduction in the growth rate of production from the Western Canada Sedimentary Basin, as a result of developments in the Canadian "frontier" areas.

Natural Gas Supply

Canadian natural gas production is also dependent on the level of exports to the United States. In contrast to oil, it is not expected that overseas imports will have a significant impact on markets now served by Canadian gas.

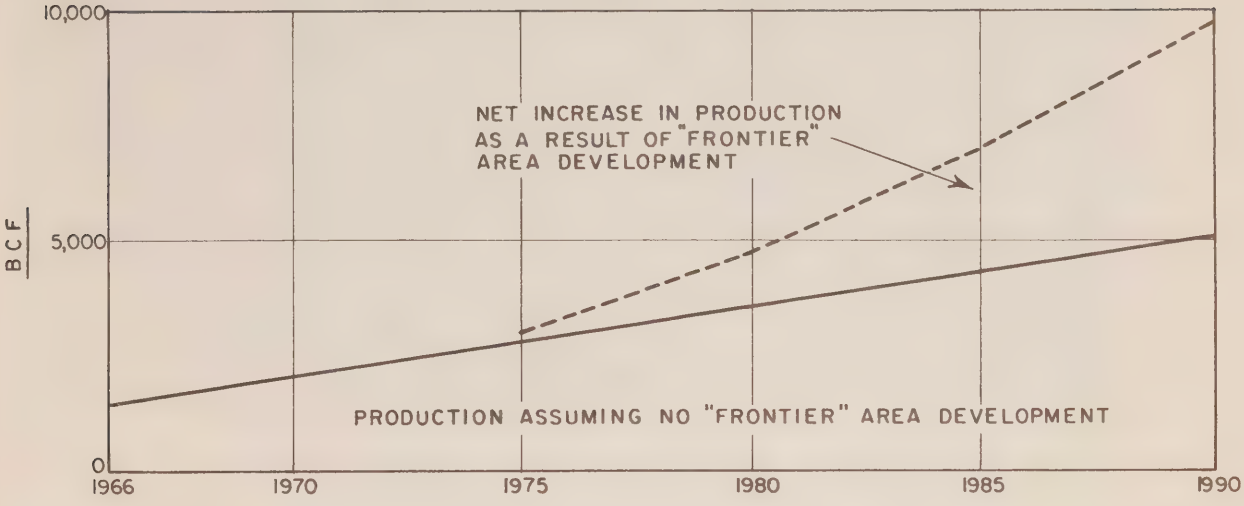
- Gas markets available to Canadian production were calculated on the basis that there would be no change in the marketing pattern of Canadian gas in Canada with the possible exception of a pipe line to Vancouver Island in the mid-seventies.
  - — current Canadian policy in relation to gas export would continue
  - — Production of gas from Alaska would not affect the marketing of Canadian gas
  - — Canadian gas exports to the United States would increase from the current three per cent to a maximum of fifteen per cent of United States domestic demand by 1990 to fill part of the increasing shortage in United States conventional domestic gas supply.
- The resource potential of Canadian gas production was also examined under Case A and Case B on the same basis as for oil. (See Figure II-3)

CANADIAN NATURAL GAS PRODUCTION
(Bcf)

	Actual	Estimated	
	1966	1975	1990
Case A	1,342	2,897	4,942
Case B	1,342	3,021	9,595

FIGURE II — 3

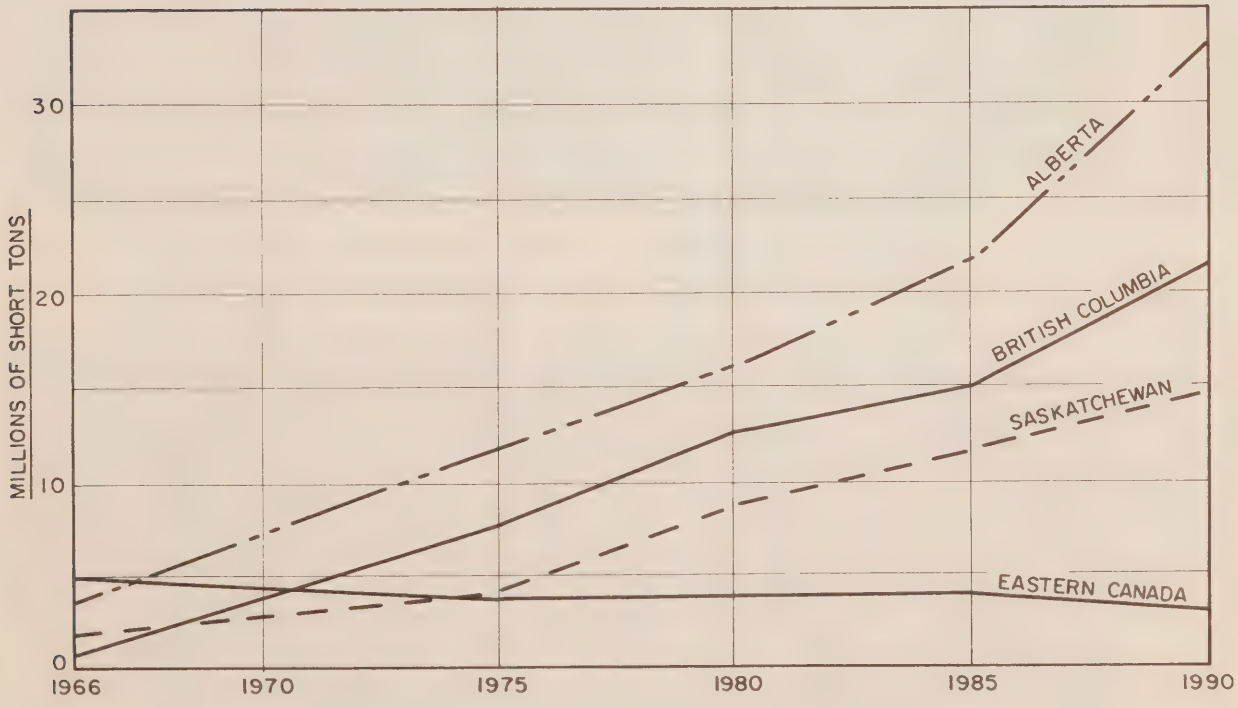
CANADIAN NATURAL GAS PRODUCTION
ACTUAL 1966 ESTIMATED 1975, 1980, 1985, 1990
(B C F).



SOURCE: APPENDIX C

FIGURE II — 4

CANADIAN COAL PRODUCTION BY REGION
(MILLIONS OF SHORT TONS)



SOURCE : APPENDIX C, TABLE 20.

Coal and Coke Supply

- Canadian coal production is estimated to increase over six-fold between 1966 and 1990. (See Figure II-4)

COAL PRODUCTION IN CANADA BY SOURCE
(Millions of short tons)

	Actual	Estimated	
	1966	1975	1990
Eastern Canada			
Nova Scotia and New Brunswick	4.8	3.5	3.0
Western Canada			
Saskatchewan	2.1	4.0	14.1
Alberta	3.5	11.6	32.4
British Columbia, Yukon and N.W.T.	1.1	7.5	21.8

- The bulk of production currently is bituminous although the relative importance of this type of coal will decline while that of sub-bituminous will increase over the forecast period.

COAL PRODUCTION IN CANADA BY TYPE
(Millions of short tons)

	Actual	Estimated	
	1966	1975	1990
Bituminous	6.7	15.6	32.3
Sub-Bituminous	2.6	7.0	24.7
Lignite	2.1	4.0	14.1

- Saskatchewan lignite and Alberta sub-bituminous production is used for generation of electricity within the Western Provinces. Production of bituminous coal in Alberta and British Columbia will in the main result from export demand.

EXPORTS OF COAL
(Millions of short tons)

	Actual	Estimated	
	1966	1975	1990
Alberta	0.7	4.4	7.5
British Columbia	0.4	7.0	13.0
	1.1	11.4	20.5

- Imports of coal, to supply demand in Ontario and Quebec for industrial and thermal generation use, will increase from about 17 million tons in 1966 to 24 million tons in 1990.

Electricity Supply

- Hydro sources accounted for 82 per cent of total generation of electricity in 1966. By 1990, its share of total generation will drop to 45 per cent. Nuclear and, to a lesser extent, coal fired thermal generation will increase in relative importance over the forecast period.
- By 1990, total electricity use in Canada will reach 620 thousand GWH as compared with 159 thousand GWH in 1966.
- Utilities, as opposed to industry, will account for an increasing share of total net generation—up from 80 per cent in 1966 to 94 per cent in 1990.
- Sources of energy to generate electricity within individual regions will shift over the forecast period (See Figure II-5).
- Installed generating capacity in Canada is estimated to increase nearly five-fold by 1990.

ESTIMATED INSTALLED GENERATING CAPACITY
(Thousands of MW)

Region	Actual	Estimated	
	1966	1975	1990
Atlantic Provinces	1.9	8	15
Quebec	10.6	13	33
Ontario	8.8	19	44
Prairie Provinces	3.9	8	22
British Columbia, Yukon and N.W.T.	3.8	7	19
	29.0	55	133

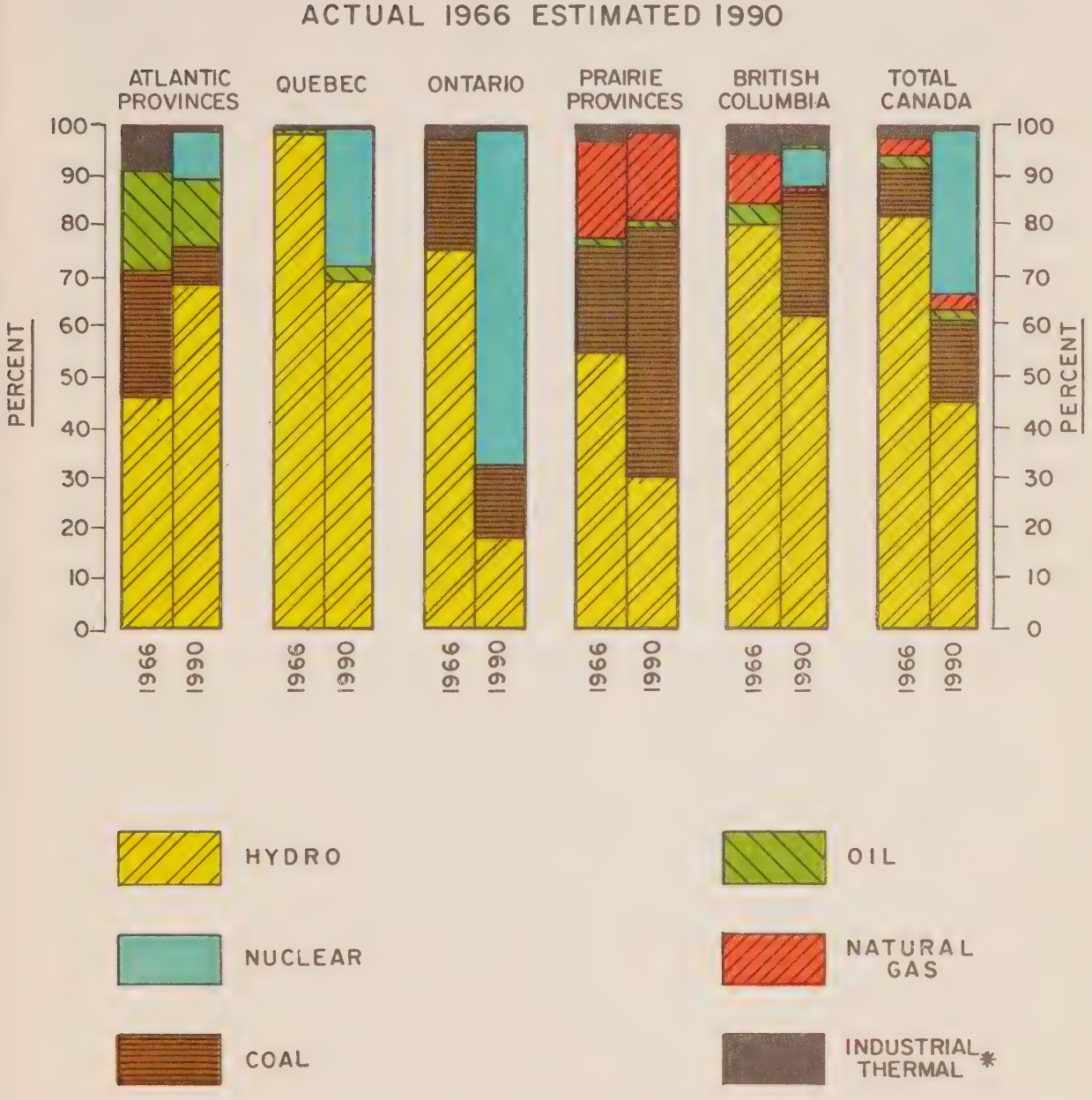
- Thermal generation by utilities is expected to increase at an average annual growth rate of 11.6 per cent over the forecast period. The main portion of this growth will be nuclear.
- Nuclear generation, assuming continued use of the CANDU type reactor, will involve annual fuel "burn-up" increasing from 3 tons of U_3O_8 in 1966 to about 4,000 tons in 1990. In addition, a large fuel inventory will be required, increasing from 700 tons of U_3O_8 in 1975 to 7,200 tons in 1990.
- Installed nuclear capacity will increase from 2,500 MW in 1975 to 31,500 MW in 1990.
- Conventional thermal generation by utilities will also grow substantially by 1990.

FUEL USE FOR CONVENTIONAL THERMAL GENERATION BY UTILITIES
(Trillions of Btu's)

Fuel	Actual	Estimated	
	1966	1975	1990
Coal	181	520	1,225
Oil	37	50	190
Natural Gas	64	90	235
	282	660	1,650

FIGURE II — 5

RELATIVE IMPORTANCE OF SOURCES OF ENERGY TO GENERATE ELECTRICITY



* CANNOT BE FURTHER BROKEN DOWN BY SPECIFIC SOURCE OF FUEL.
SOURCE: APPENDIX C TABLE 19

III

RESIDENTIAL AND COMMERCIAL ENERGY DEMAND IN CANADA

The energy requirements of the residential and commercial sector were the most important segment of total energy demand in Canada in 1966. However, over the forecast period the residential and commercial sector shows the slowest growth of the three demand sectors.

Because electricity energy statistics cannot be separated into residential use and commercial use, the approach used in this chapter has been to deal first with combined residential and commercial demand for energy. This discussion is followed by separate discussions of residential energy demand and commercial energy demand.

COMBINED RESIDENTIAL AND COMMERCIAL ENERGY DEMAND

Oil will continue to be the most important source of energy for the residential and commercial sector in Canada over the forecast period. However, both natural gas and electricity[1] will grow at much faster rates. By 1990, demand for natural gas and for electricity will be close to that for oil. (See Figure III-1 and Appendix C Table 8.)

The relative importance of individual sources of energy will vary from region to region and will also vary over time (see Figure III-2).

The relative importance of energy for residential and commercial use will decrease in all but the Atlantic Regions. Natural gas is expected to be the most important single source of energy for this demand sector, except in Quebec and the Atlantic Regions, which will continue to be heavily dependent on oil. Electricity will increase in relative, as well as absolute, terms in all regions over the forecast period.

Ontario and Quebec, the most heavily populated provinces, will account for the majority of residential and commercial energy demand, as tabulated below. (See also Figure III-3).

[1] Includes electrical energy used for space-heating and for cooking, lighting, air-conditioning, etc.

RESIDENTIAL AND COMMERCIAL ENERGY DEMAND BY REGION
(Trillions of Btu's)

Province or Region	Actual 1966	Estimated 1975	Estimated 1990
Newfoundland	28	36	54
Maritimes	104	123	167
Quebec	370	481	788
Ontario	505	666	1,107
Manitoba	73	87	124
Saskatchewan	72	84	110
Alberta	134	173	275
British Columbia	102	139	243
Yukon and N.W.T.	4	6	11
	1,392	1,795	2,879

The substantial growth in electricity demand in the residential and commercial sector is indicated in the following tabulation:

ELECTRICITY DEMAND IN THE RESIDENTIAL AND COMMERCIAL SECTOR BY REGION[2]
(Trillions of Btu's)

Region	Actual 1966	Estimated 1975	Estimated 1990
Newfoundland	2	3	9
Maritime Provinces	8	15	33
Quebec	54	97	238
Ontario	78	143	357
Manitoba	12	19	40
Saskatchewan	7	12	24
Alberta	11	21	54
British Columbia	18	35	89
Yukon and N.W.T.	—	1	2
	190	346	846

[2] Source: Appendix C, Tables 8 and 19.

1. *Residential Energy Demand*[3]

Residential energy demand has been analyzed in relation to two classes of end-use (i) space-heating (including electrical space-heating) and, (ii) general use (such as water heating, cooking, clothes drying and air-conditioning).

In the past, space-heating has undergone rather drastic changes in the type of fuel and equipment used and in the amount of space heated. Because

[3] As indicated earlier, historical electricity demand in the residential sub-sector cannot be determined from official statistics. Therefore, this discussion of residential energy demand is restricted to fuel demand by type plus electrical space-heating use.

no increases are expected either in the average size of dwelling units or the fuel use per dwelling unit space-heating demand has been projected in proportion to the expected increase in the number of dwelling units.

General use has much more growth potential, since the great majority of dwelling units fall far short of household equipment saturation. Energy requirements for purposes other than space-heating are increasingly met by electricity. In areas where natural gas is the predominant space-heating fuel, it is also used to supply a portion of general uses. Water heating with natural gas is well established. However, the demand for natural gas for uses other than space-heating appears to be declining in relative terms even in Alberta where gas has great cost advantages over other sources of energy.

The procedure followed in estimating residential energy demand is outlined in Appendix B. On that basis, total residential energy demand (including that portion of total electricity demand used for space-heating only) will increase by about 50 per cent between 1966 and 1990. During this period, natural gas will replace oil as the most important fuel in this sector, and residential use of coal will disappear by 1990.

RESIDENTIAL ENERGY DEMAND IN CANADA[4]
(Trillions of Btu's)

	Actual	Estimated	
Type of Energy	1966	1975	1990
Coal	37	15	—
Oil	440	460	475
Natural Gas	211	330	570
Electricity for all-electric space-heating	5	24	65
Wood	63	41	18
Other (including LPG)	11	16	26
	767	886	1,154

[4] Excluding electricity, except for all-electric heated households.

2. *Commercial Energy Demand*[5]

Apparent 1966 commercial fuel consumption and projected commercial consumption were derived by deducting residential consumption from combined residential and commercial consumption (as reported in the DBS statistics) by year.

In projecting commercial consumption the following assumptions were made:

(a) commercial demand will increase at a rate of 1 per cent per year when measured on the basis of consumption per household; and,

[5] As indicated earlier, historical electricity demand in the commercial sub-sector cannot be determined from official statistics. Therefore, the discussion of commercial energy demand is restricted to fuel demand by type of fuel.

(b) the use of electricity and LPG for space-heating is not significant in the commercial sector.

Based on these assumptions, total commercial fuel consumption is estimated to increase from about 440 trillion Btu's in 1966 to 586 trillion in 1975, and 945 trillion by 1990. During this period commercial demand is projected to account for an increasing share of combined residential and commercial fuel demand — up from 37 per cent in 1966 to 45 per cent in 1990.

RESIDENTIAL AND COMMERCIAL DEMAND BY TYPE OF ENERGY

The projected trends in residential and commercial demand by type of fuel, by provinces are summarized in Table III-1. (More detailed information is shown in Appendix C Table 9).

1. *Oil*

Light fuel oil is the major type of oil used in all areas of Canada except the Prairie Provinces. It generally is used in residential space-heating and in small commercial establishments. As such it is in direct competition with natural gas and electric space-heating. Its growth seems assured only in parts of Eastern Canada.

Heavy fuel oil presently is the second most important type of oil on a national basis. Its use is generally restricted to larger commercial establishments and apartment heating. It faces competition from natural gas and, to a limited extent, from electricity. Although natural gas is making great inroads in the commercial and apartment space-heating market, the trend to dual-fuel installations is gaining ground. With dual-fuel installations, commercial establishments are able to purchase relatively low cost natural gas, deliveries of which may be interrupted by the distributor. Using this type of arrangement a more economical use of fuel can be effected, which as a result assures a certain demand for HFO in areas where natural gas is otherwise dominant. Once again, all the growth will be in Quebec and the Atlantic Provinces.

Diesel-fuel[6] currently is the most important oil used in the residential and commercial sector in the Prairie Provinces. Increased farm use is the main reason for estimated growth in diesel fuel demand. As a result of the proportionately large use of diesel fuel in Saskatchewan (and to a lesser extent Manitoba) not much further growth has been assumed for these provinces. Consolidation of farming in the other provinces should provide impetus to increased dieselization. The projected growth in Alberta also is based on probable increases in land under cultivation. The overall average annual growth rate of 3.1 per cent is considerably higher than for the other oil categories.

In general, the use of kerosene or stove oil, which pour readily even in cold weather, is dominant in areas that are subject to severe climatic condi-

[6] In many cases diesel fuel and light fuel oil are interchangeable. As a result some difficulties arise in preparing end-use classification.

tions and which rely on outside tanks. Kerosene and stove oil use is expected to decline over the forecast period in all provinces except Quebec and Alberta where they will replace wood.

2. *Natural Gas*

Relatively high average annual growth rates are projected over the forecast period in Ontario, Quebec and British Columbia. The Maritimes are not expected to have gas service by 1990. No allowance has been made for the importation of continuous supplies of liquefied natural gas for base load. LNG may, however, be imported for peak-shaving purposes.

3. *Electricity*

Aggregate demand data for 1966 was allocated to the residential and commercial sector (and other sectors) on the basis of the last year for which a final detailed breakdown is available (that is, 1963).

For the residential and commercial sector it was assumed that the rate of growth will decline slightly over the forecast period, as a result of increasing saturation of the market for appliances drawing heavy loads of electricity.

4. *Coal*

On the assumptions adopted for this study, the use of coal in the residential and commercial sector will virtually disappear before 1990.

TABLE III-1

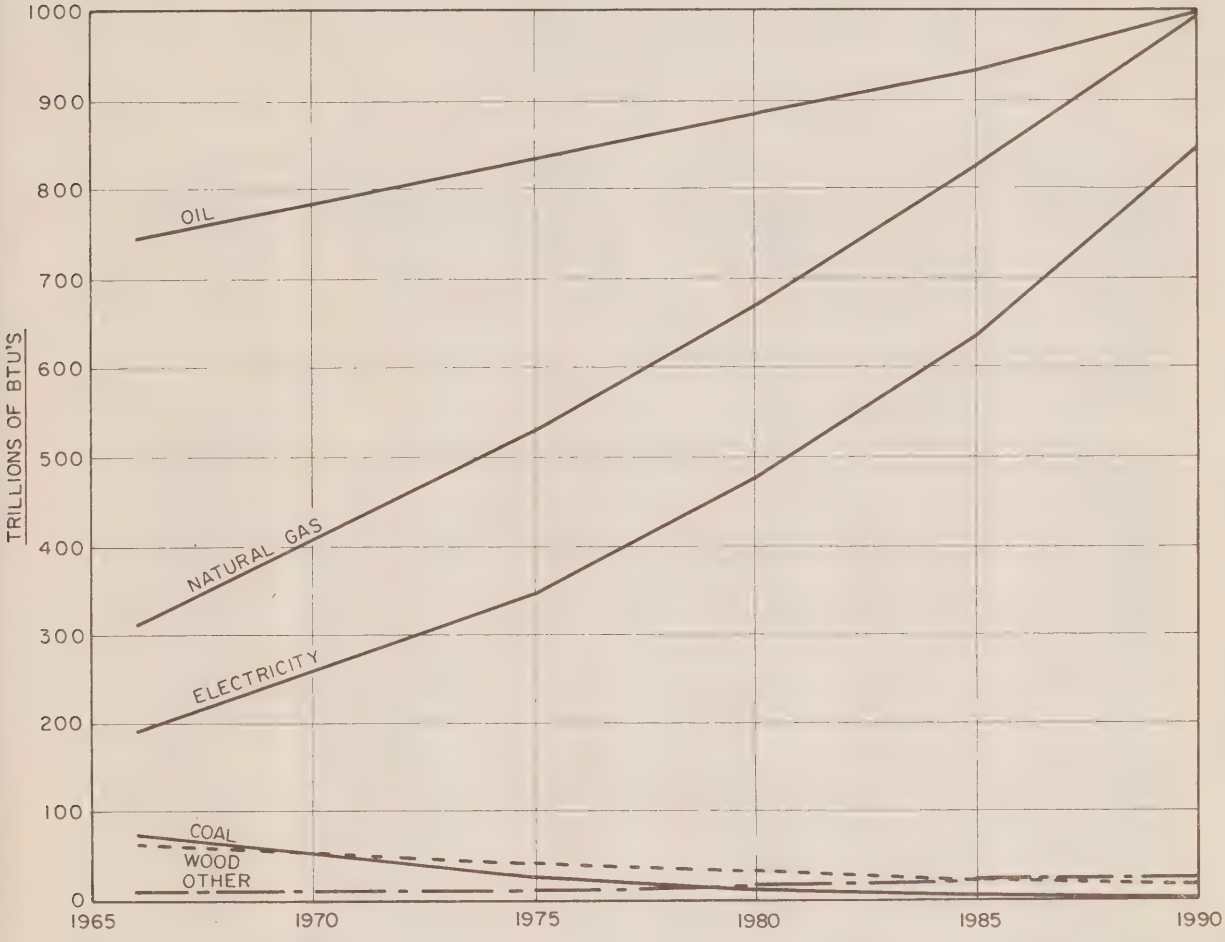
RESIDENTIAL AND COMMERCIAL DEMAND BY TYPE OF ENERGY BY PROVINCE

	Oil			Natural Gas			Coal			Electricity		
	1966	1975	1990	1966	1975	1990	1966	1975	1990	1966	1975	1990
	(Millions of barrels)			(Bcf)			(Millions of tons)			(Millions of GWH)		
Newfoundland	3.5	5.3	7.4	—	—	—	0.1	—	—	0.5	1.1	2.7
Maritime Provinces	12.5	16.3	22.0	—	—	—	0.5	0.2	—	2.3	4.3	9.5
Quebec	45.0	55.5	76.5	13	31	84	0.3	—	—	15.8	28.4	69.7
Ontario	44.4	44.6	45.0	124	233	476	1.0	0.6	—	23.1	42.2	104.4
Manitoba	4.4	3.6	2.7	27	43	65	0.2	—	—	3.5	5.5	11.8
Saskatchewan	4.9	4.3	3.3	31	43	63	0.1	0.1	—	2.0	3.4	7.1
Alberta	2.9	3.5	5.4	87	122	183	0.5	0.1	—	3.3	6.1	15.9
British Columbia	7.7	6.8	4.3	29	58	122	0.1	—	—	5.2	10.3	26.1
Yukon and N.W.T.	0.5	0.8	1.4	—	—	—	—	—	—	0.1	0.2	0.6
Total Canada	125.8	140.7	168.0	311	530	992	2.8	1.0	—	55.8	101.5	247.8

NOTE: Figures may not add due to rounding.
SOURCE: Appendix C, Tables 9 and 19.

FIGURE III — 1

RESIDENTIAL AND COMMERCIAL ENERGY DEMAND IN CANADA BY TYPE OF ENERGY



SOURCE: APPENDIX TABLES 8 AND 19.

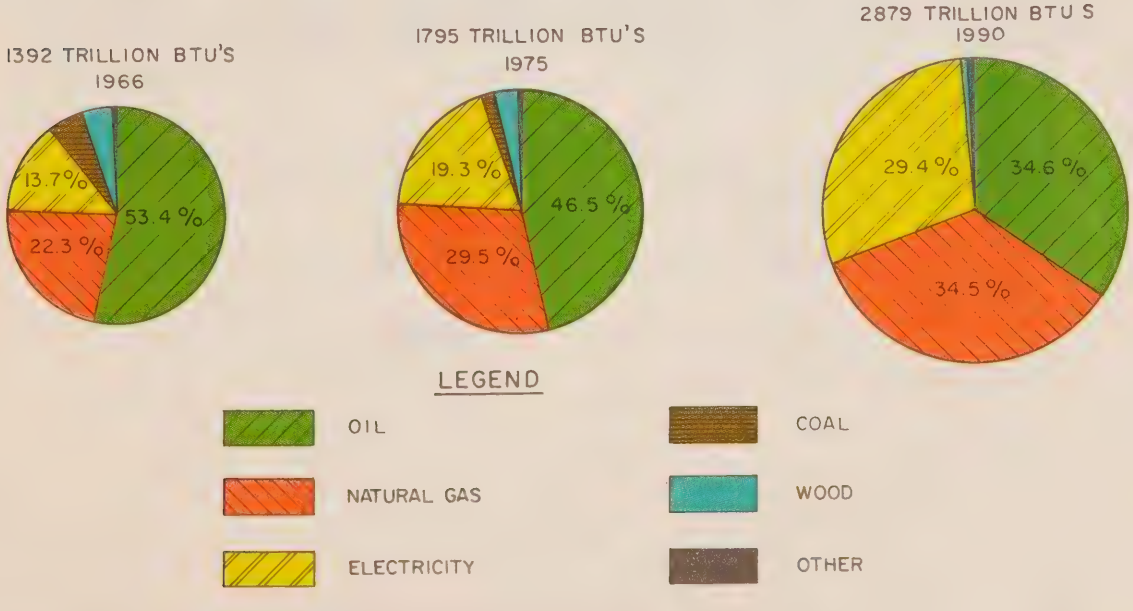
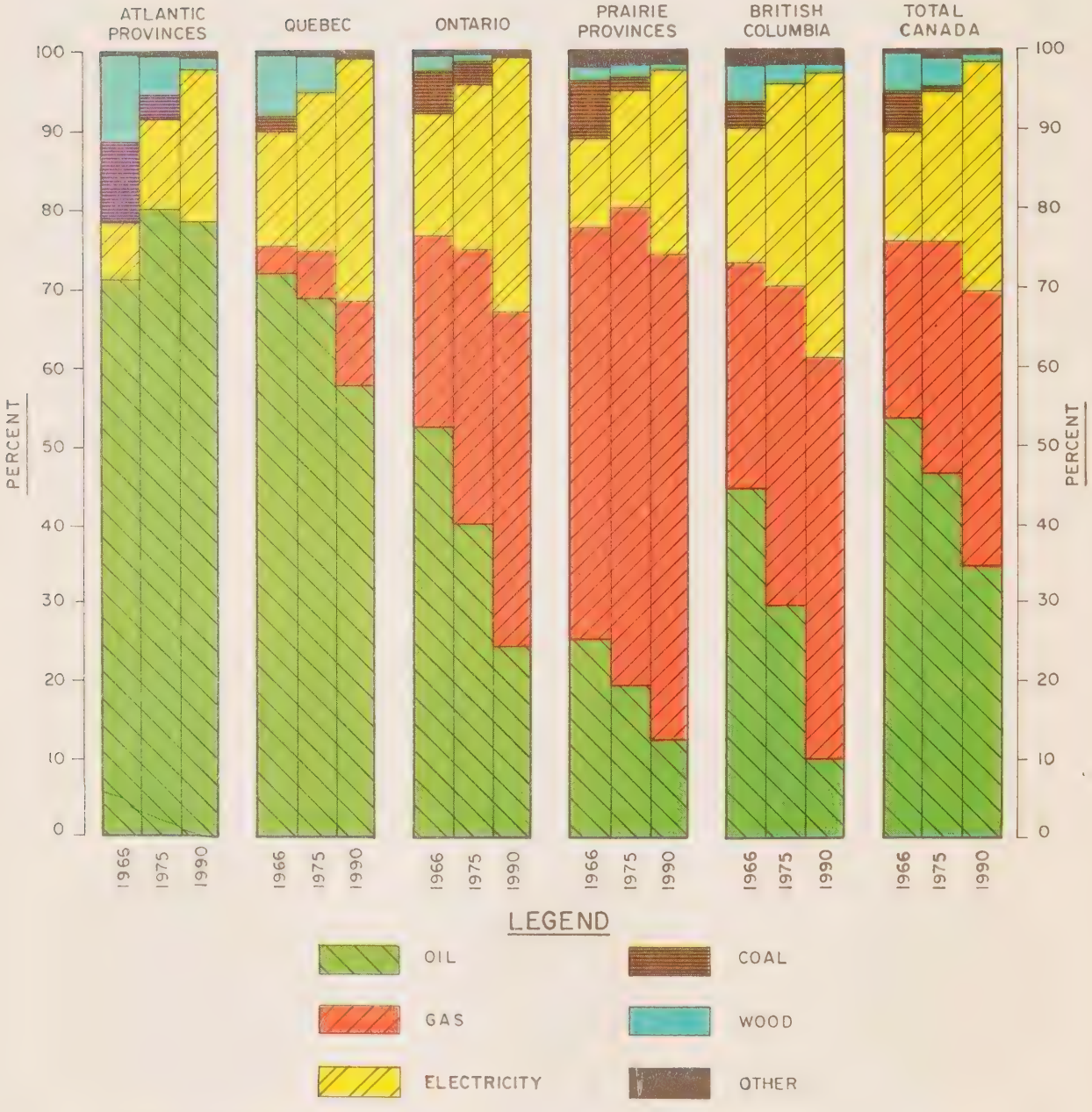


FIGURE III — 2

RELATIVE IMPORTANCE OF VARIOUS TYPES OF RESIDENTIAL AND COMMERCIAL ENERGY BY REGION

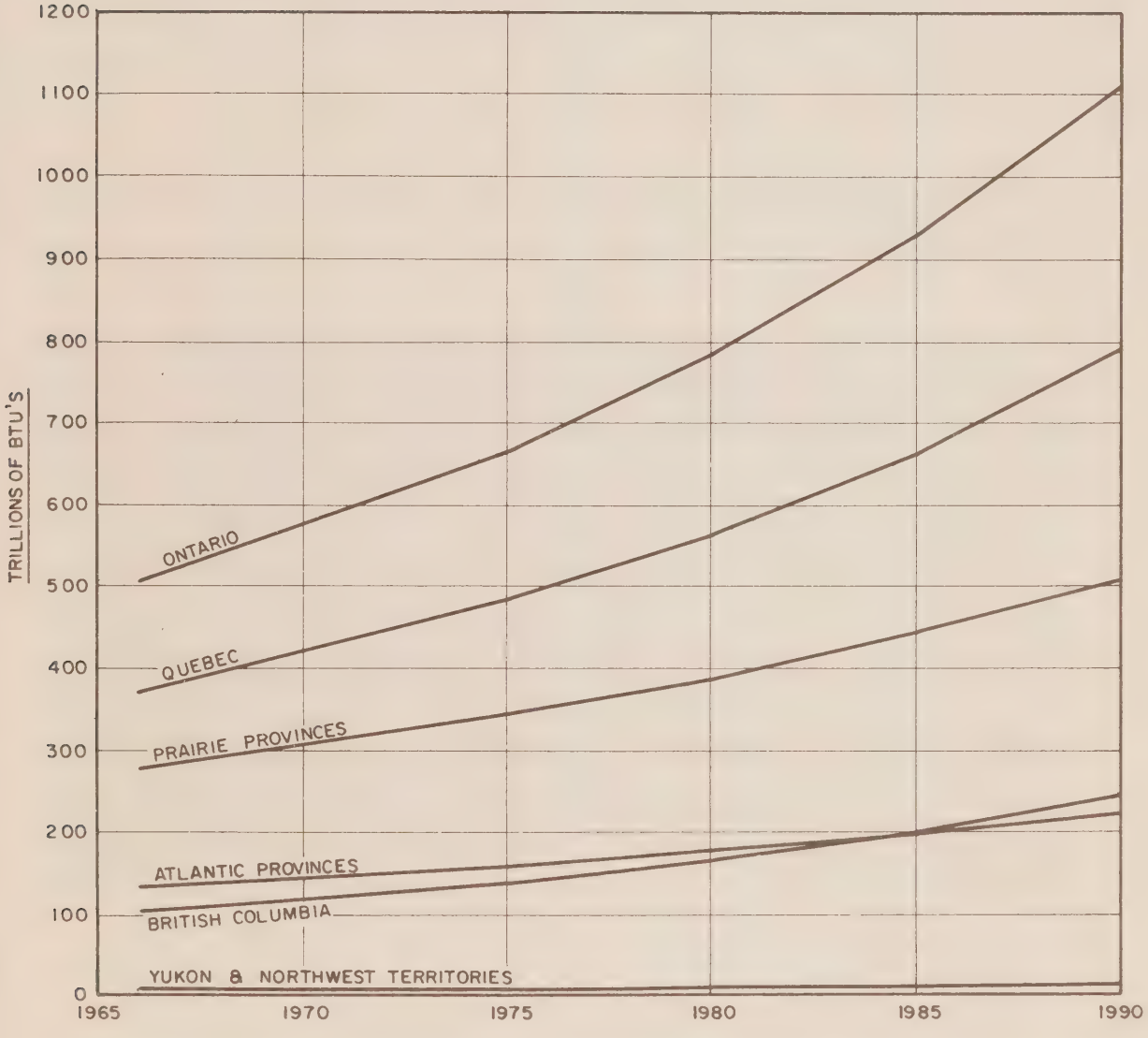


SOURCE: APPENDIX TABLES 8 AND 19

FIGURE III — 3

RESIDENTIAL AND COMMERCIAL ENERGY DEMAND BY REGION

TRILLIONS OF BTU'S



SOURCE: APPENDIX TABLES 8 AND 19

IV

INDUSTRIAL ENERGY DEMAND IN CANADA

The energy requirements of the industrial sector were only slightly lower than those of the residential/commercial sector in 1966. Industrial energy requirements will exceed those of the residential/commercial sector beginning about 1975.

INDUSTRIAL ENERGY REQUIREMENTS[1]
(Trillions of Btu's)

	Actual	Estimated	
	1966	1975	1990
Coal	358	337	381
Oil	335	487	872
Natural Gas	260	556	1,198
Electricity	287	481	1,065
	1,240	1,861	3,516

[1] These requirements exclude non-energy demand for petroleum products (including petrochemical feedstocks, solvent naphtha, asphalt, lubricating oils, greases and petroleum coke) which are discussed at the end of this chapter. The use of fuel for thermal generation of electricity by utilities is also excluded.

Demand for natural gas, electricity and oil will increase substantially between 1966 and 1990. (See Figure IV-1 and Table IV-1.) Natural gas is expected to become the most important source of energy. Annual demand for industrial coal will not change materially through 1990.

The relative importance of individual forms of energy will vary significantly from province to province. In the Atlantic Provinces, electricity use will increase in relative importance, largely at the expense of coal. (See Figure IV-2).

In Quebec, electricity will increase in relative importance and will continue to be the most important single source of energy. The relative importance of oil and coal will diminish while that of natural gas will increase.

In Ontario, natural gas will replace coal as the most important single fuel early in the forecast period. Electricity will also increase in importance significantly by 1990.

In the Prairie Provinces natural gas will continue to dominate the industrial energy market through 1990.

In British Columbia electricity will replace oil as the most important source of industrial energy early in the forecast period. However, about 1990, natural gas is expected to become the most important source.

The expected shift in the relative importance of regional demand for industrial energy is illustrated in Table IV-1 and Figure IV-3.

1. *Industrial Fuel Demand by Region*

The following discussion deals with demand for industrial fuel excluding electricity. Electric energy purchased by industry and self-generated hydroelectricity are separately discussed later in this chapter.

In projecting industrial fuel demand in each province or region, the relative magnitude of existing industrial fuel use, and recent historical trends were taken into account. In addition, consideration was given to reasonably predictable developments which may alter these trends over the forecast period. The projections are summarized in the following tabulation:

INDUSTRIAL FUEL DEMAND BY REGION[2]
(Trillions of Btu's)

Region	1966	1975	1990
Atlantic Provinces	65	105	155
Quebec	206	269	420
Ontario	466	630	1,040
Manitoba	23	34	58
Saskatchewan	28	55	100
Alberta	82	134	298
British Columbia	86	145	347
Yukon and N.W.T.	3	8	33
	959	1,380	2,451

[2] SOURCE: Appendix C, Table 10.

Newfoundland's industrial fuel demand, which is comparatively small, was assumed to continue to grow through 1990 at the average growth rate of over 6 per cent per year experienced in the 1949-1966 period.

The current industrial fuel demand in the Maritime Provinces is also comparatively small — about 5 per cent of total Canadian industrial fuel demand. Overall demand was assumed to grow mainly due to specific projects such as the Glace Bay and Point Tupper heavy water plants and expansion of the pulp and paper industry. Glace Bay will require significant amounts of coal beginning in 1969, and Point Tupper significant quantities of oil after

1970. In addition, general industrial fuel use was arbitrarily projected to increase by 2 trillion Btu's per year between 1966 and 1970, and by 1 trillion Btu's per year thereafter.

Except for its use for coking purposes, and in the Glace Bay plant, coal is expected to be rapidly replaced by oil in the Maritimes. Oil is the preferred fuel. Also, as a result of the phasing out of certain coal mines located in the Maritime Provinces, less coal will be available.

The comparatively large industrial fuel use in Quebec was assumed to grow through 1990 at its 1949-1966 average rate of 3 per cent per year. Industrial use of coal was assumed to decrease by about 50,000 tons annually because less Canadian coal will be available and because imported coal will not be competitive with heavy fuel oils, particularly in view of refinery expansions planned for locations in Eastern Canada. Industrial natural gas use was related to a load distribution analysis of residential and commercial use. Allowance has been made for the installation of natural gas liquefaction facilities which reduce amounts of gas available for industrial use during the liquefaction (summer) season. No major new extension of gas distribution facilities has been taken into account. It was further assumed that oil will make up the remainder of industrial demand and that electricity will not be used in electric boilers[3].

Industrial fuel use in Ontario was assumed to grow through 1990 at the 1949-1966 average rate of 3.4 per cent per year. About 50 per cent of total coal consumption is used as general industrial fuel and 50 per cent for the production of coke. These combined coal uses exceed the use of oil and gas on a Btu basis. It was assumed that coal for coke production in Ontario would grow about 2 per cent per year through 1990 in line with steel industry coke requirements, and that industrial coal demand would drop from 130 trillion Btu's in 1966 to about 100 trillion Btu's in 1970. It would remain at that level through 1990. This 1966-1970 drop is attributed to expected increased competition from natural gas. It was also assumed that industrial oil use will grow more slowly than natural gas use up to 1980. From 1981-1990, it is expected that oil use will accelerate. Its competitive position may improve as interruptible natural gas availability gradually diminishes.

In Manitoba, industrial fuel demand is assumed to increase at about 6 per cent per year through 1971, and at 3.6 per cent per year from 1972-1990, or significantly higher than the 1949-1966 average annual rate of 2.8 per cent. Northern Manitoba industrial development in forest products and mining will result in a moderate increase in fuel oil use through 1990. Industrial use of coal is assumed to decline over the forecast period as a result of strong competition from natural gas.

Industrial fuel use in Saskatchewan was arbitrarily assumed to increase at 3 trillion Btu's per year, primarily as a result of expected further expansion

[3] If surplus (secondary) electricity from hydraulic sources is available where electric boilers are installed, periodic use will of course be made of these facilities.

of the potash industry. In the first few years of the forecast period, the 3 trillion Btu annual increase is higher than the 1949-1966 average of over 9 per cent per year. By 1990, the 3 trillion Btu increment will be equivalent to about 3 per cent growth per year.

Industrial fuel demand in Alberta is assumed to increase through 1990 at 5.5 per cent per year, the actual annual growth rate experienced in recent years. The use of coal and oil is expected to grow moderately over the forecast period. Natural gas use will increase substantially.

Industrial fuel use in British Columbia is assumed to increase at 6 per cent per year through 1990 compared with actual growth of about 7 per cent per year between 1949 and 1966. The estimates provide for further extension of gas service on the mainland, plus extension of gas service to Vancouver Island after 1975.

No published historical trends are available for the Yukon and Northwest Territories. It was assumed that industrial fuel demand would increase by about 10 per cent per annum through 1990. This increase would consist almost entirely of diesel fuel, serving the rapidly expanding activities of both the mining and petroleum industries.

2. *Industrial Electricity Demand*

Apparent electric energy purchased (plus self-generated hydro-electricity) in 1966, and estimates over the forecast period resulted from the allocation of total electricity demand, first by province, or region, then within geographical unit between the residential/commercial sector and the industrial sector. The method of allocation is outlined in Appendix B.

The following tabulation shows quantities of electrical energy purchased by industry and self-generated hydro-electricity by region or province.

PURCHASED AND SELF-GENERATED HYDRO-ELECTRICITY BY REGION
(Trillions of Btu's)

Region	1966	1975	1990
Atlantic Provinces	16	35	92
Quebec	123	183	345
Ontario	83	135	289
Prairie Provinces	18	45	154
British Columbia	46	82	182
Yukon and N.W.T.	1	1	3
	287	481	1,065

It was assumed that Newfoundland will be successful in attracting industries which require comparatively large quantities of electricity. Maritime Provinces' requirements are expected to grow in line with recent historical trends.

Historical use of electricity in Quebec reflects, among other major elements, the requirements of the existing aluminum industry. Since no major

new expansion in aluminum smelting is anticipated over the forecast period, future electricity requirements will grow at slightly lower rates than experienced in recent years.

Ontario industrial electricity demand is also expected to grow at somewhat lower rates than historically. In future, secondary manufacturing will be comparatively more important than resource-based industries which generally are large users of electricity.

The relatively rapid growth shown for the Prairie Provinces reflects anticipated further expansion of the potash industry in Saskatchewan and the petroleum industry in Alberta.

In British Columbia, growth in electricity demand up to 1975 will be substantially lower than historical experience, primarily because no major expansion of aluminum smelting is expected.

Electricity demand by industry in the Yukon and Northwest Territories is expected to grow at historical rates.

NON-ENERGY USE OF PETROLEUM

Non-energy use of petroleum covers certain non-fuel products such as petrochemical feedstocks[4], solvent naphtha, asphalt, lubricating oils, greases, and petroleum coke. Virtually all petroleum coke is used for metallurgical purposes.

Non-fuel products constitute 8.2 per cent of total product sales in 1966. By 1990, their share of total product sales is expected to increase to 13.5 per cent.

Estimates through 1990 were made for each of these products by region. Petrochemical feedstock was assumed to increase at 8.5 per cent per year. By 1990, the ratio of petrochemical feedstock to total non-fuel products is estimated to reach 62 per cent compared with only 35 per cent in 1966.

NON-ENERGY USE OF PETROLEUM
(Millions of Barrels)

	Actual	Estimated	
Product	1966	1975	1990
Petrochemical Feedstock	12	24	84
Solvent Naptha	2	3	6
Asphalt	12	17	28
Lubes & Greases	4	6	12
Petroleum Coke	3	4	6
	33	54	136

[4] Although substantial volumes of natural gas are used as feedstock, especially for the production of ammonia, it was not possible to separate the volumes involved. Hence, this use of natural gas remains, in this discussion, within industrial energy demand for natural gas.

On a regional basis, the greatest growth in demand for petrochemical feedstock is expected to be in Ontario and Quebec. The following tabulation shows the actual 1966 and estimated 1975 and 1990 breakdown of non-energy product demand by province.

NON-ENERGY PRODUCT DEMAND
(Millions of Barrels)

	Actual	Estimated	
	1966	1975	1990
Newfoundland	—	—	1
Maritime Provinces	2	2	4
Quebec	11	18	49
Ontario	13	23	57
Manitoba	1	1	1
Saskatchewan	1	1	2
Alberta	4	7	17
British Columbia	2	2	5
Yukon and N.W.T.	—	—	—
	34	54	136

TABLE IV-1

INDUSTRIAL ENERGY DEMAND BY PROVINCE

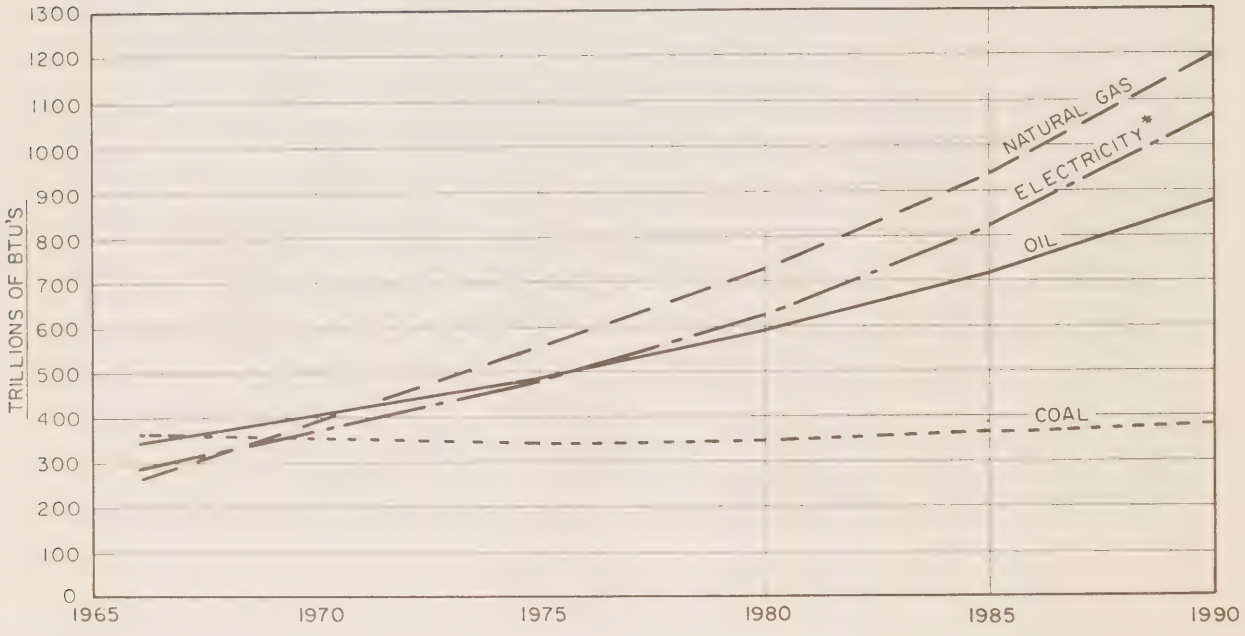
	Oil			Natural Gas			Coal			Electricity[1]		
	1966	1975	1990	1966	1975	1990	1966	1975	1990	1966	1975	1990
	(Millions of barrels)			(Bcf)			(Millions of tons)			(Thousands of GWH)		
Newfoundland	2.3	3.9	9.5	—	—	—	—	—	—	2.2	5.4	13.3
Maritime Provinces	2.7	9.3	11.8	—	—	—	1.3	0.9	0.9	2.5	4.9	13.8
Quebec	20.9	25.9	40.3	19	67	148	2.0	1.6	0.8	36.2	53.6	101.0
Ontario	16.0	21.4	45.7	116	248	454	9.6	9.6	11.6	24.4	39.6	84.6
Manitoba	0.9	1.5	1.6	11	21	45	0.4	0.3	0.2	2.4	4.1	10.1
Saskatchewan	0.9	1.3	2.1	22	46	86	0.1	0.1	0.1	0.9	4.1	13.2
Alberta	2.0	2.4	3.3	67	115	273	0.2	0.2	0.3	1.8	5.1	22.0
British Columbia	8.4	12.0	21.4	25	59	192	0.4	0.5	0.9	13.5	24.0	53.4
Yukon and N.W.T.	0.5	1.3	5.6	—	—	—	—	—	—	0.2	0.3	0.7
Total Canada	54.6	79.0	141.3	260	556	1,198	14.0	13.2	14.8	84.1	141.1	312.1

[1] Excludes self-generated thermal electricity.

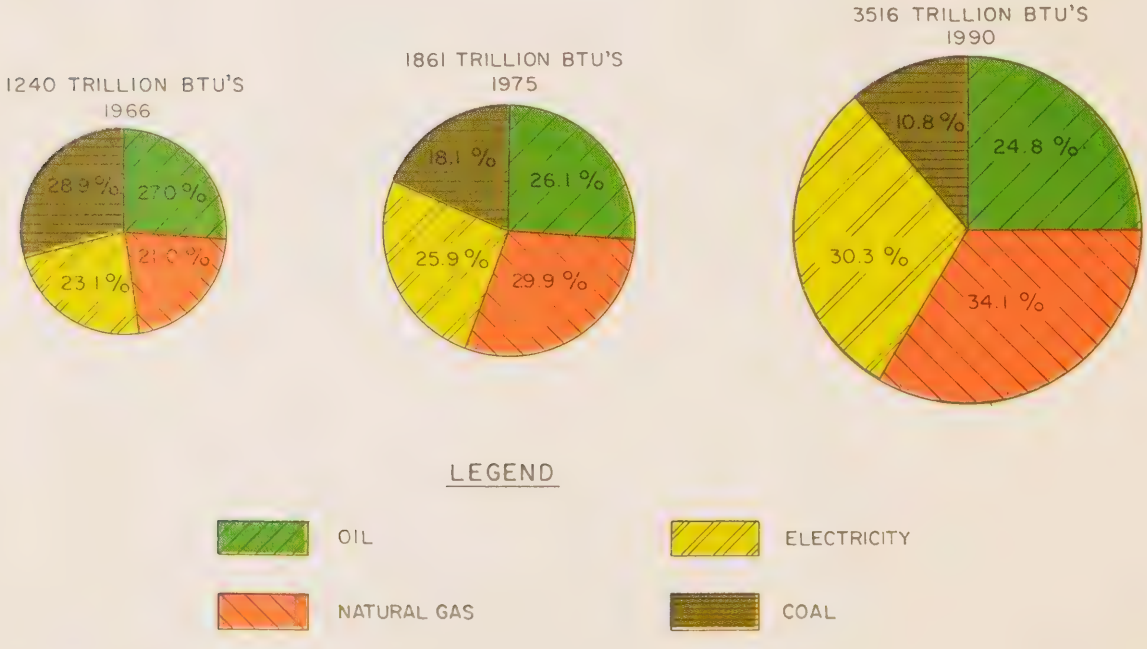
SOURCE: Appendix C, Tables 10 and 19.

FIGURE IV — 1

INDUSTRIAL ENERGY DEMAND IN CANADA
BY TYPE OF ENERGY
1966 TO 1990
(TRILLIONS OF BTU's)



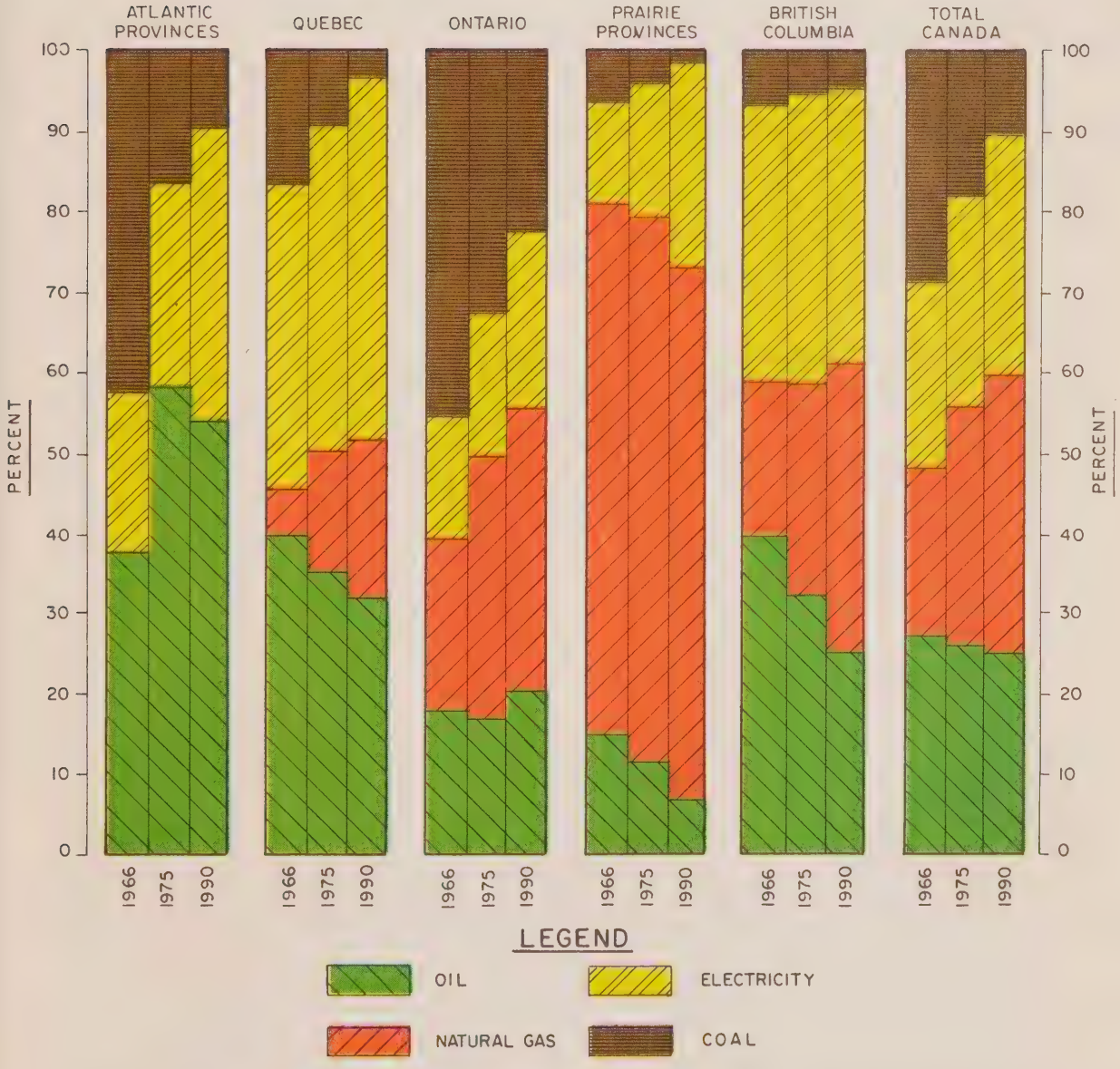
* INCLUDES SELF - GENERATED THERMAL ELECTRICITY SINCE THE FUEL USED IN THIS GENERATION IS INCLUDED IN THE FUEL PORTION. (ie COAL, OIL AND GAS)



SOURCE: APPENDIX TABLES 10 AND 19

FIGURE IV — 2

RELATIVE IMPORTANCE OF VARIOUS TYPES OF INDUSTRIAL ENERGY BY REGION 1966, 1975 AND 1990

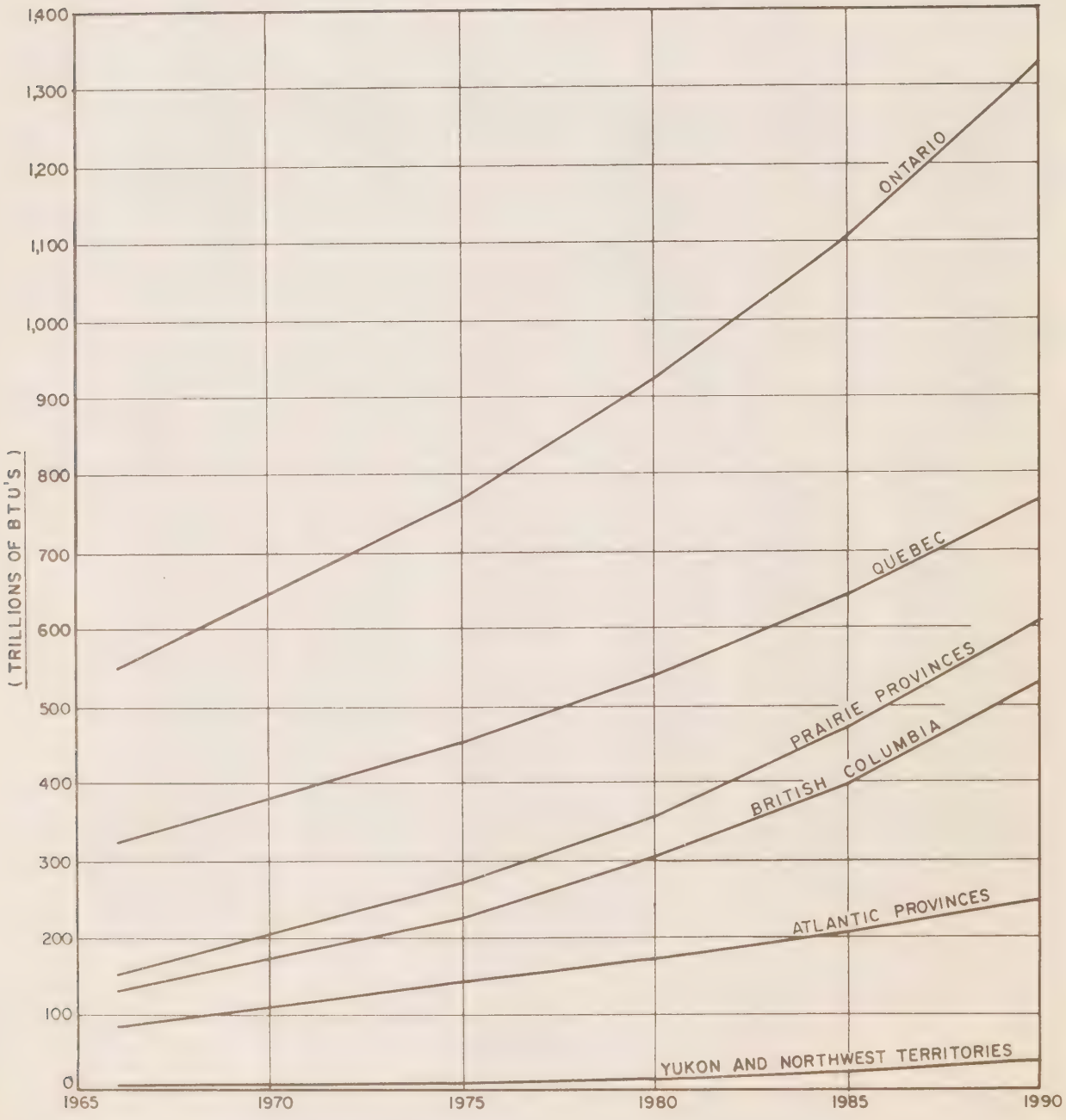


NOTE: ELECTRICITY INCLUDES SELF-GENERATED THERMAL ELECTRICITY SINCE THE FUEL USED IN THIS GENERATION IS INCLUDED IN THE FUEL PORTION (i.e. COAL, OIL AND GAS).

SOURCE: APPENDIX TABLES 10 AND 19

FIGURE IV — 3

INDUSTRIAL ENERGY DEMAND BY REGION
1966 TO 1990
(TRILLIONS OF BTU's)



SOURCE: APPENDIX TABLES 10 AND 19

V

TRANSPORTATION ENERGY DEMAND IN CANADA

The energy requirements of the transportation sector were substantially lower than those of either the residential/commercial or industrial sectors in 1966. However, by 1990, transportation energy requirements will be only slightly less than energy requirements of the residential/commercial sector. Virtually 100 per cent of requirements will continue to be made up of petroleum fuel.

TRANSPORTATION ENERGY DEMAND[1]
(Trillions of Btu's)

	Actual	Estimated	
Type of Energy	1966	1975	1990
Motor Gasoline	711	1,055	1,768
Diesel Fuel	123	177	326
Heavy Fuel	71	86	114
Turbo Fuel	54	132	492
Aviation Gasoline	9	8	6
Coal	14	5	—
	982	1,463	2,706

[1] This tabulation excludes gas transmission pipe line fuel and losses which are shown below. Separate statistics for electrically-powered prime movers are not available. The tabulation also excludes all electricity losses, which are shown below:

	1966	1975	1990
	(Trillions of Btu's)		
Gas pipe line fuel and losses	67	120	184
Electricity losses	4	8	18
	71	128	202

Motor gasoline will continue to be the dominant source of energy for this sector (see Figure V-1 and Table V-1). In the second half of the forecast

period, turbo fuel will replace diesel oil as the second most important source of energy for the transportation sector.

The relative importance of individual sources of energy will vary from province to province (see Figure V-2). Motor gasoline demand will be particularly important in Ontario and the Prairie Provinces. Total transportation energy requirements will grow fastest in Ontario and Quebec (see Figure V-3).

TRANSPORTATION ENERGY REQUIREMENTS BY REGION
(Trillions of Btu's)

	Actual	Estimated	
Region	1966	1975	1990
Newfoundland	19	30	58
Maritime Provinces	79	109	163
Quebec	247	394	785
Ontario	330	482	908
Manitoba	51	68	106
Saskatchewan	60	80	115
Alberta	92	132	227
British Columbia	102	161	318
Yukon and N.W.T.	2	7	26
	982	1,463	2,706

Transportation fuel requirements are examined by use (such as rail or marine transport) and by type of prime mover (for example, diesel or gasoline engine). These uses are all grouped under the general category of commercial, notwithstanding that some aviation and marine fuel use is for private and other non-commercial purposes. Conversely the energy demand of the automobile was necessarily calculated as inclusive of all automobiles, and was regarded as non-commercial, despite the fact that many automobiles are used for commercial purposes.[2] Fuel demand for use in automobiles was subjected to a detailed analysis, which is described in Appendix B.

In 1966, fuel consumption by the automobile exceeded the total consumption for commercial transport. However, before 1990, the positions will be reversed as indicated below:

[2]Because of inadequate statistical data, energy reguirements by use in the general commercial category could not be derived by correlating regional fuel requirements with appropriate transportation needs. Total Canadian requirements were projected, by extrapolating historical trends, and were subsequently distributed on a provincial basis.

TRANSPORTATION ENERGY REQUIREMENTS BY TYPE OF FUEL[3]
(Millions of Barrels)

	1966		1975		1990	
COMMERCIAL TRANSPORT						
Truck Freight						
Motor Gasoline	37		55		111	
Diesel Fuel	5	42	7	62	12	123
Aviation						
Aviation Gasoline	2		1		1	
Turbo Fuel	10	12	24	25	91	92
Marine						
Diesel Fuel	5		8		17	
Heavy Oil	11	16	14	22	18	35
Rail						
Diesel Fuel		11		16		27
Total Commercial		81		125		277
Automobile						
Motor Gasoline		99		147		228
Total Automobile		99		147		228

SOURCE: Appendix C Table 11

ENERGY DEMAND OF COMMERCIAL TRANSPORT

1. *Truck Freight*

Trucking constitutes the most important mode of commercial transport. Fuel requirements are expected to increase three-fold over the forecast period. The relative importance of motor gasoline — the major fuel — versus diesel oil is not expected to change by 1990. In arriving at these projections, the fact that the volume of freight carried by trucks closely reflects the development of a specific region was taken into account. Trucking activity is largely localized within a province.

Farm consumption in the agriculture-oriented Prairie Provinces is assumed to grow only slightly from the present level. Farming on the Prairies is currently responsible for a much higher than average proportion of fuel consumption than in other areas. A higher rate of growth is anticipated in the urban areas.

2. *Aviation*

Before 1990 energy requirements for aviation transport will become second in importance to energy demand for trucking.

[3] Excluding coal use in marine and rail transportation, which use will disappear before 1990. Requirements by federal and provincial governments, including those of the armed forces, are included in the respective end-use categories.

Turbo fuel, which is taken to include all fuels used for aviation other than aviation gasoline, is the petroleum product for which demand is growing the fastest (see Figure V-1). Turbo fuel will account for nearly all of the transportation requirements of the aviation sub-sector. Major airlines have virtually completed the change-over to turbo or jet propulsion. The few remaining piston-engine aircraft are expected to have been retired by airlines within a few years. While higher growth rates were suggested by responsible sources to the National Energy Board staff, a relatively conservative forecast of 900 per cent increase in aircraft fuel requirements by 1990 was assumed.

Overall Canadian turbo fuel and aviation gasoline growth was projected at an average rate of 8.9 per cent per year to 1990, which reflects anticipated rapid and consistent expansion of airline use for both domestic and international travel. Increased domestic traffic will result from a number of social, economic and business developments such as rising per capita income of the Canadian labour force.

The use of aviation gasoline in Canada for general flying should decrease from about 2 million to 1 million barrels between 1966 and 1990. Because of increasing economic activity in the Yukon and Northwest Territories, a considerable increase in aviation gasoline use is expected in these areas owing to the need to use piston-engine aircraft.

Projected Canadian aviation fuel requirements were allocated regionally according to expected air facility developments. Toronto, Montreal, and Vancouver are expected to be the major growth centres.

3. *Marine*

Over the forecast period, energy requirements of marine transport will more than double. Diesel oil will capture an increasing share of total marine requirements. Heavy fuel is used in the transportation sector only for marine transport. Since ship propulsion appears to be shifting increasingly to diesel fuel, heavy fuel use was projected to grow at only 2 per cent per year over the forecast period.

Between 1966 and 1990 the ports in the Province of Quebec will gain from the expansion of both ocean and Great Lakes shipping activity. Growth in wheat, coal, and iron ore shipments will have a direct impact on the Ontario marine sector. The assumption that bulk export and general Pacific trade will develop at a rapid rate is reflected in the relatively high rate of growth for British Columbia.

4. *Rail*

Fuel demand for rail transportation is expected to remain as the least important among the four modes under the commercial sector, reaching only 27 million barrels of diesel oil by 1990.

Rail and marine fuel requirements are expected to grow at roughly the same rate in the Maritime Provinces and Quebec. The high rate of growth projected in British Columbia is due to the fact that comparatively more of

rail freight originating in the Prairies will be exported through West Coast ports. The westward movement of bulk commodities involves rail transport only whereas a substantial part of eastward movement is routed through the Seaway system.

The increasing role which Canadian railroads may play as a "land bridge" or connection for containerized freight moving between Pacific countries and Europe was also taken into account.

ENERGY DEMAND OF AUTOMOBILES

Demand for automobile gasoline will more than double between 1966 and 1990. Forecasts of gasoline consumption by automobiles are generally derived from estimates of probable future stocks of automobiles. Two separate methods of projecting automobile population in this study are described in Appendix B. For purposes of this study it was assumed that automobiles powered by electricity, fuel cells, LPG or LNG will not make up a significant portion of the total by 1990.

TABLE V-1

ENERGY DEMAND OF THE TRANSPORTATION SECTOR BY PROVINCE

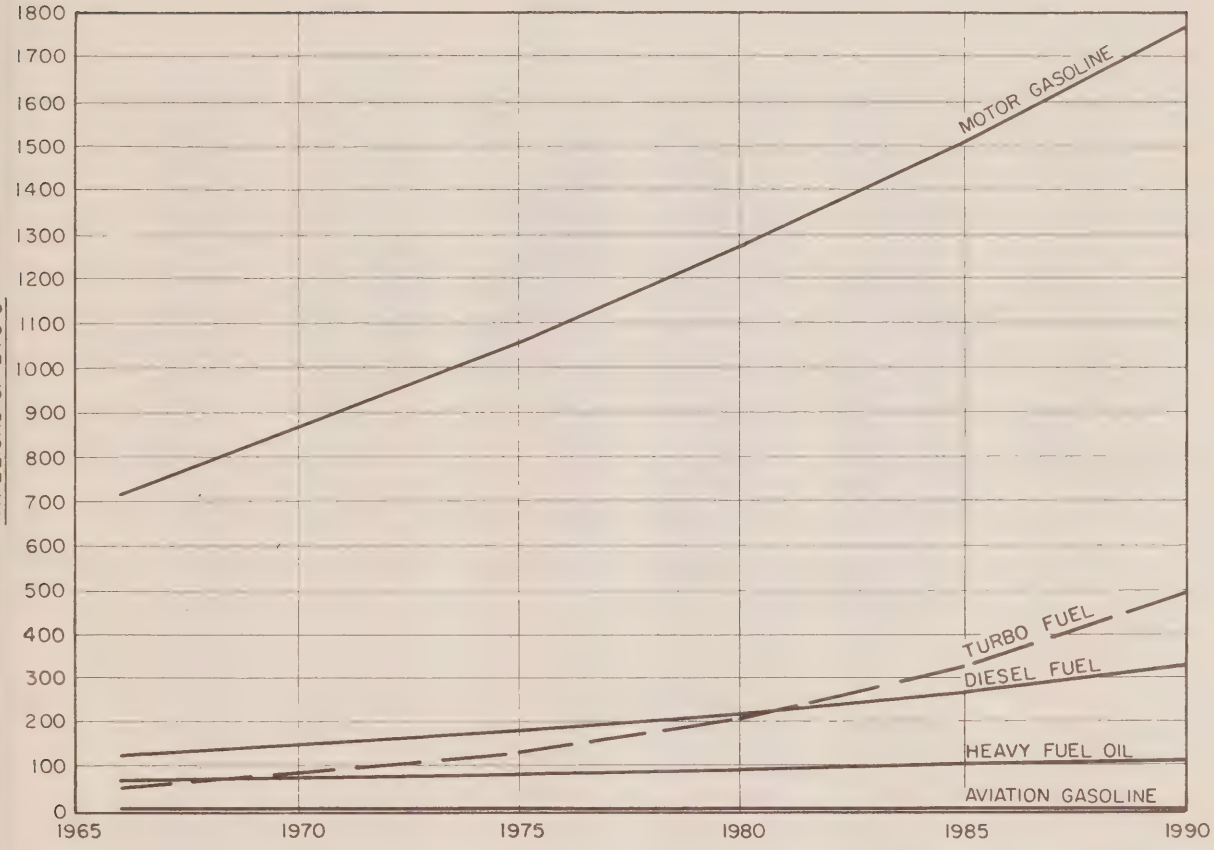
(Millions of Barrels)

	Motor Gasoline			Turbo Fuel			Diesel Fuel			Heavy Fuel Oil			Aviation Gasoline			Total		
	1966	1975	1990	1966	1975	1990	1966	1975	1990	1966	1975	1990	1966	1975	1990	1966	1975	1990
Newfoundland	1.8	3.1	6.1	0.5	0.9	2.5	1.1	1.5	2.1	0.2	0.2	0.3	0.1	0.1	—	3.6	5.8	11.0
Maritime Provinces	8.5	11.8	15.8	0.7	1.5	4.1	2.2	3.1	5.3	2.6	3.1	4.2	0.3	0.2	0.1	14.3	19.7	29.5
Quebec	32.1	52.2	94.7	3.0	7.4	29.5	5.0	7.2	13.6	5.1	6.3	8.2	0.2	0.2	0.1	45.4	73.3	146.0
Ontario	50.0	72.9	124.6	2.8	7.1	30.2	4.6	6.7	12.2	2.3	2.7	3.7	0.3	0.2	0.2	60.0	89.6	170.8
Manitoba	6.9	9.8	12.5	0.9	1.8	4.3	1.2	1.6	2.8	—	—	—	0.2	0.2	0.1	9.1	13.4	19.7
Saskatchewan	9.5	12.5	17.0	0.3	0.5	1.0	1.4	2.0	3.5	—	—	—	0.1	0.1	—	11.3	15.1	21.5
Alberta	13.8	18.9	28.5	1.0	2.2	7.1	2.4	3.5	6.7	—	—	—	0.2	0.2	0.1	17.4	24.8	42.5
British Columbia	13.3	21.1	37.5	0.9	2.6	10.2	3.0	4.6	9.4	1.2	1.4	1.9	0.4	0.3	0.1	18.8	30.0	59.0
Yukon and N.W.T.	0.2	0.6	1.8	—	0.3	1.9	0.1	0.3	0.7	—	0.2	—	0.1	0.2	0.4	0.4	1.6	4.7
Total Canada	136.2	202.1	338.6	10.1	24.3	90.7	21.1	30.5	56.2	11.3	13.7	18.2	1.8	1.4	1.2	180.4	272.0	504.8

NOTE: Figures may not add due to rounding.
SOURCE: Appendix C, Table 11.

FIGURE V — 1

TRANSPORTATION FUEL DEMAND IN CANADA
BY TYPE OF FUEL
1966 TO 1990



NOTE: GRAPH EXCLUDES COAL USE WHICH IS ASSUMED TO DECLINE FROM 13.5 TRILLION BTU'S IN 1966 TO ZERO IN 1985.

SOURCE : APPENDIX TABLE II

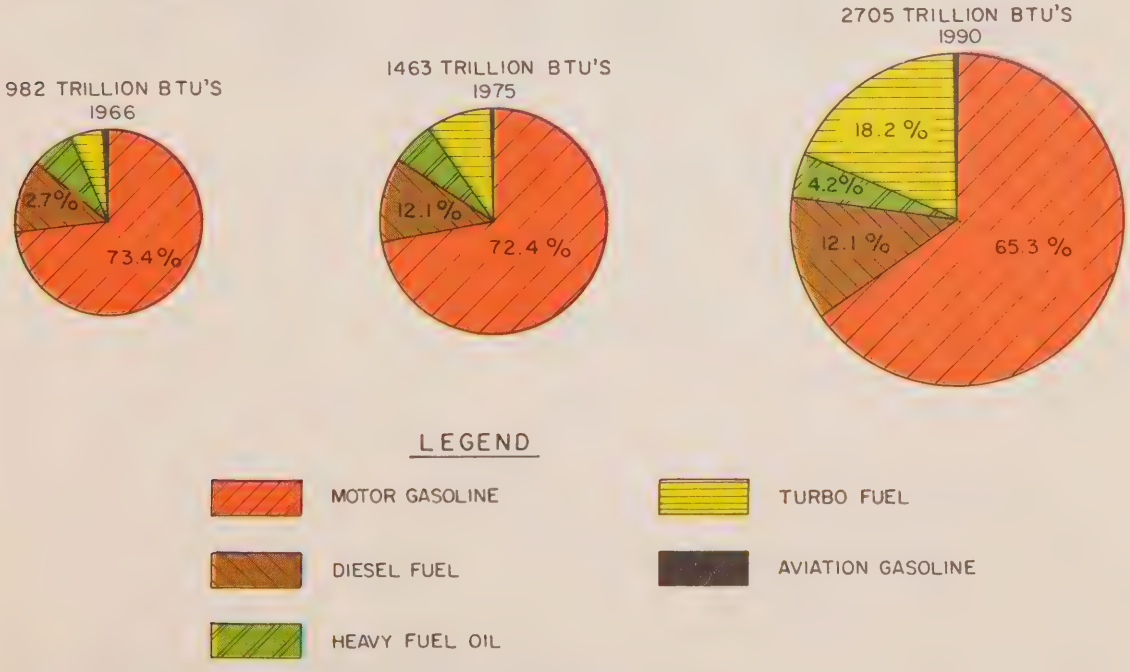
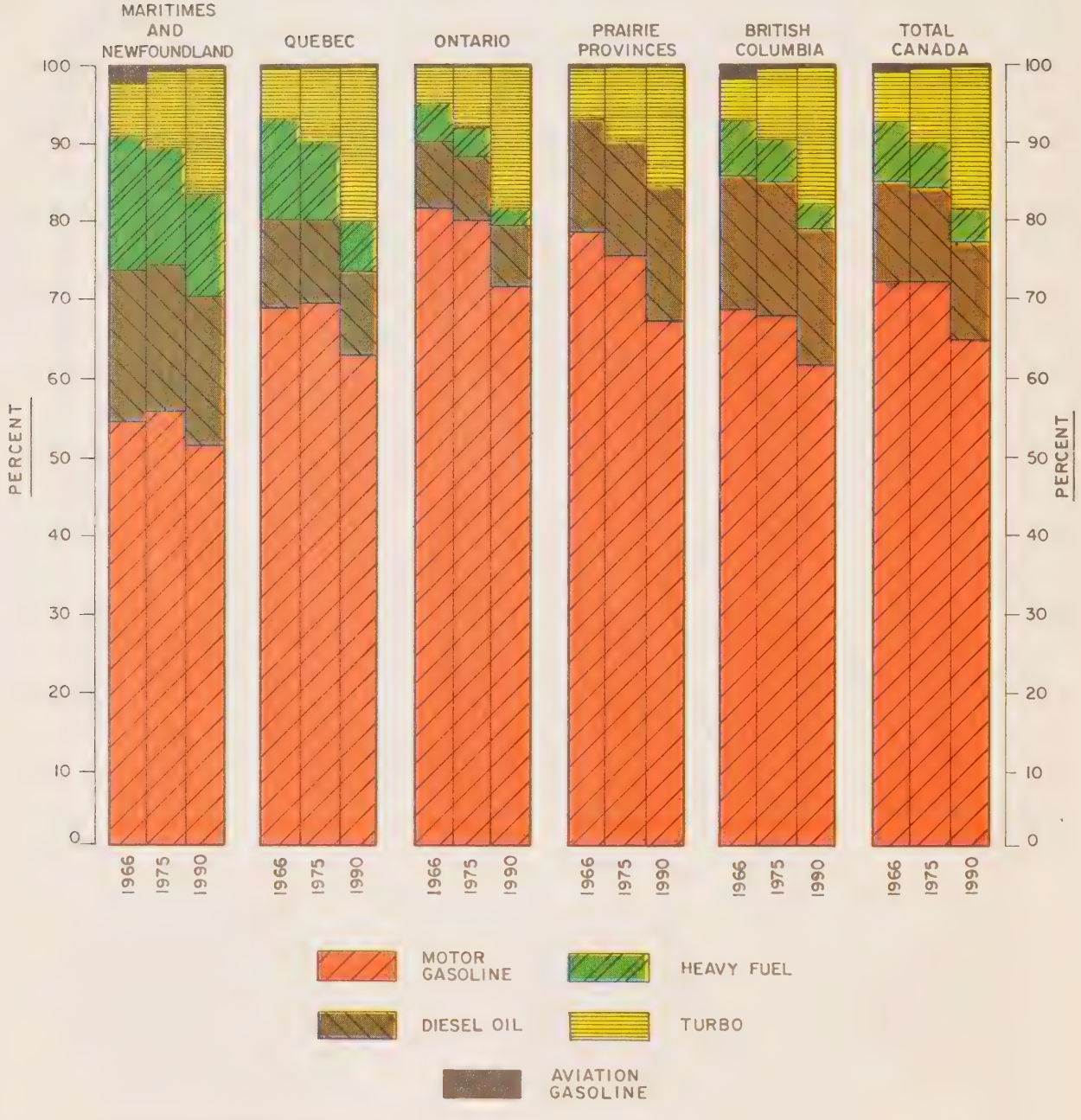


FIGURE V — 2

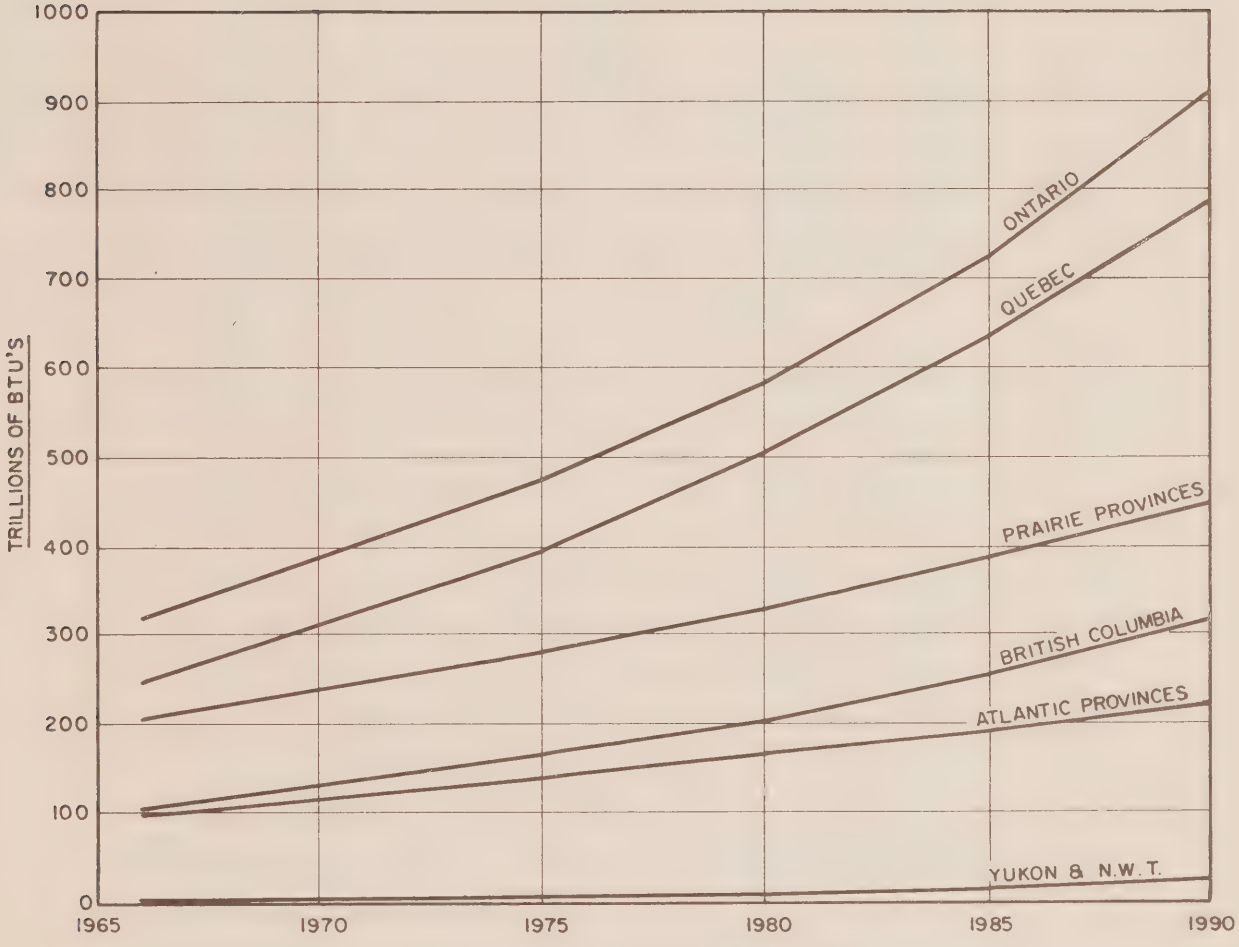
RELATIVE IMPORTANCE OF VARIOUS FUELS FOR TRANSPORTATION BY REGION & TOTAL CANADA



SOURCE: APPENDIX TABLE II

FIGURE V — 3

TRANSPORTATION FUEL DEMAND BY REGION
1966 TO 1990
(TRILLIONS OF BTU's)



SOURCE: APPENDIX TABLE II

VI

PETROLEUM SUPPLY IN CANADA

This chapter is based upon an assessment of United States petroleum demand and supply and the range of Canada's possible participation in supplying this demand, which constitutes the only apparent outlet for Canadian petroleum production in excess of what can be used in Canada. The chapter includes an illustrative analysis of the opportunities for Canadian oil production which might be associated with several different rates of Alaska North Slope production.

The chapter also presents several cases for Canadian demand and supply, which are based on the following two extreme major premises:

1. Canadian production comes only from the Western Canada Sedimentary Basin, or

2. Canadian production comes from the Western Canada Sedimentary Basin and from reserves discovered in Canada's "frontier areas", that is, the West Coast, the Arctic Islands and offshore, Hudson Bay, the Atlantic offshore, the Gulf of St. Lawrence and the Gaspe (see Figure VI-1 and 2). This extreme assumed maximum marketing opportunities for Canadian crude oil production.

First, however, a review of problems and uncertainties of forecasting petroleum supply seems appropriate.

As indicated in Chapter I, forecasting as a general rule is a very difficult undertaking. However, forecasting petroleum supply is particularly difficult at this time due to the fact that North American reserves apparently doubled almost overnight as a result of recent crude oil discoveries on the North Slope of Alaska.

The timing and magnitude of any future discoveries in one or more of the Canadian frontier areas mentioned above could alter existing supply projections. Conservative analysis of data available at the time of this study indicates that these Canadian areas contain nearly 90 billion barrels of recover-

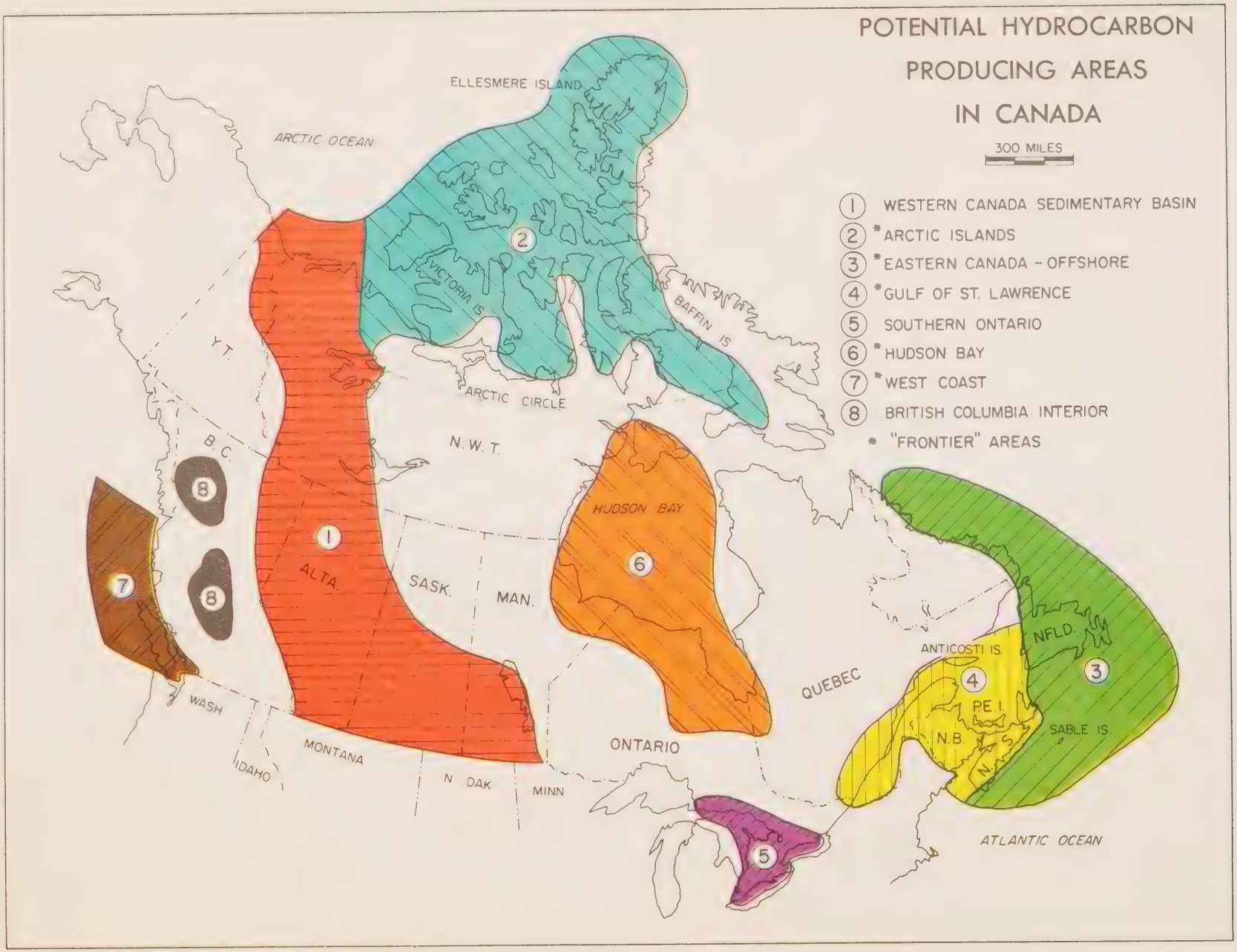

POTENTIAL HYDROCARBON PRODUCING AREAS IN CANADA
300 MILES
1 WESTERN CANADA SEDIMENTARY BASIN
2 *ARCTIC ISLANDS
3 *EASTERN CANADA – OFFSHORE
4 *GULF OF ST. LAWRENCE
5 SOUTHERN ONTARIO
6 *HUDSON BAY
7 *WEST COAST
8 BRITISH COLUMBIA INTERIOR
* "FRONTIER" AREAS
ELLESMERE ISLAND
ARCTIC OCEAN
VICTORIA IS
BAFFIN IS
ARCTIC CIRCLE
Y.T.
B.C.
N.W.T.
ALTA.
SASK.
MAN.
HUDSON BAY
QUEBEC
ONTARIO
NFLD.
ANTICOSTI IS.
P.E.I.
N.B.
N.S.
SABLE IS.
ATLANTIC OCEAN
WASH
IDAHO
MONTANA
N DAK
MINN

FIGURE VI — 1

able oil reserves. Any consideration of these areas raises a number of questions, for example:

1. When will large scale drilling activity be commenced to find these reserves?

2. Which region will be developed first and thereby pre-empt transportation investment capital and markets?

3. Will the regional price structure make one particular region's reserves preferable to others?

4. What will be the polices of the Canadian and United States Governments respecting domestic production, imports and exports of oil?

The timing and relative cost of new discoveries and their relative proximity to markets could affect both the production levels from developed reserves and the rate of finding replacement reserves. As a result, drilling activity could be concentrated in particular regions even though some drilling activity is currently going on in several of the frontier areas.

These are only a few of the many questions that require answers before any definitive forecast of supply can be attempted, and a comment on the Alaska North Slope discoveries and their possible effects can now be made as a starting point. It seems probable that:

1. the first market for Alaska North Slope production is the United States west coast where the pattern of oil supply will be substantially altered;

2. Alaska production, in excess of United States PAD District V (west of the Rocky Mountains) requirements, will find its way into either United States east coast or Great Lakes regions, directly or indirectly, whether by tanker and pipe line from the west or the east coast, or by pipe line through Canada; and,

3. Alaska North Slope production will have an impact, depending on the size of production, on the growth of Canadian exports especially to District V.

The impact of Alaska North Slope discoveries must not be regarded in isolation. Much effort will also be expended to evaluate petroleum prospects on the mainland and islands of northern Canada as well as offshore territory on the east, west and north coasts. Discovery of northern or offshore oil may produce marketing opportunities for Canadian oil elsewhere, e.g.,

1. large scale production in the Northern frontier may make deliveries to Montreal economically viable; and,

2. Arctic Islands development, discoveries in the Province of Quebec, the Atlantic Provinces, or discoveries off the east coast could provide, depending on their size, some or all of the requirements for crude oil in Eastern Canadian markets and perhaps provide for exports to Europe.

Beyond these broad considerations there has been speculation regarding some form of "continental energy policy". Though the phrase may have different meanings for different people, it is frequently taken to mean that Canada and the United States should have a similar policy regarding imports in order to integrate for mutual benefit the development of resources and the crude oil supply pattern of both countries.

Having acknowledged the hazards of making an oil and gas supply forecast, it still remains necessary to attempt to do so. Obviously, the numbers will have to be changed to the degree that any of the assumptions are proven to be inappropriate. Whatever the nature of the particular changes, the one broad certainty is that the present oil (and gas) supply situation will change drastically in the next decade.

UNITED STATES PETROLEUM DEMAND AND SUPPLY

The analysis underlying this report indicates that United States petroleum demand will increase from the 1968 level of 13.4 million barrels per day to 16.7 million barrels per day in 1975 and to 26.0 million barrels per day in 1990.

Total United States imports of crude oil and products from overseas were assumed to remain over the forecast period at the 1968 level of 17.3 per cent of total United States petroleum demand (that is, 2.3 million barrels per day in 1966, 2.9 million in 1975 and 4.5 million in 1990).

United States domestic production was then calculated with the following alternate levels of Alaska North Slope production: 1 MMB/D, 2.5 MMB/D, and 4 MMB/D. The difference between United States petroleum demand and production plus imports from overseas, represents a deficiency which in the past has been filled with overland exempt imports primarily from Canada. For the future, this deficiency includes the opportunity for Canada to supply oil to the United States. Among other possible means of meeting the deficiency are a presently unforeseen increase in production in the "lower 48" states, or United States offshore production, additional imports of foreign oil, and the development of synthetic or unconventional oil supplies from oil shales or coal.

It seems clear that in the long range (1980-1990), the United States will experience a large scale deficiency in supply from domestic sources. It would be necessary for the United States to assure itself of 125 billion barrels of new reserves by 1990 in order to eliminate this deficiency even assuming overseas imports at current rates and Canadian exports at the full "opportunity" levels as shown on Figure VI-2.

Depending on the circumstances and the assumptions made in respect of these alternatives of meeting the deficiency, the "Canadian opportunity" could range from the 1966 level of 386 MB/D to 4,000 MB/D by 1990.

However, while the long range situation is clear, the nature of the United States supply-demand relationship in the near future is not as clear. During this period to 1975 petroleum supply will be very sensitive to the ability of domestic production from the "lower 48" states to maintain current levels, the timing and magnitude of deliveries from the Alaska North Slope and the rate of imports from Canada. Until recently, it had been generally expected that the United States conventional domestic production, without Alaska North Slope, would increase to some 12 MMB/D by 1975 and, after a short stable period, would gradually decline. However, there is reason to believe that the recent disappointing production performance at higher allowable rates in Texas and Louisiana may indicate that the oil production rate in the "lower 48" is near maximum now and that a peak will occur before 1975 possibly at a level slightly above 11 MMB/D. The success of oil industry efforts to increase "lower 48" production and maintain it between 11 to 12 MMB/D will depend on the impact of Alaska North Slope exploration activity, the effect of proposed tax revisions, the effect of possible changes in import regulation, and the marketing arrangements for the indicated large Alaska North Slope reserves.

It will require an extraordinary level of exploration effort with corresponding high success ratios to achieve and to maintain such production at a rate of 11 to 12 MMB/D, while at the same time maintaining a reserve to production ratio near the current level. To illustrate, at this rate of production it would be necessary to discover in the "lower 48" the equivalent of a 25 billion-barrel "Prudhoe Bay" field every six years (60 per cent of present reserves); it would be necessary to find the equivalent of Canada's entire current recoverable reserves every two and one-half years; it would be necessary to increase United States gross additions to reserves by 30 per cent above recent experience over a very short period of time.

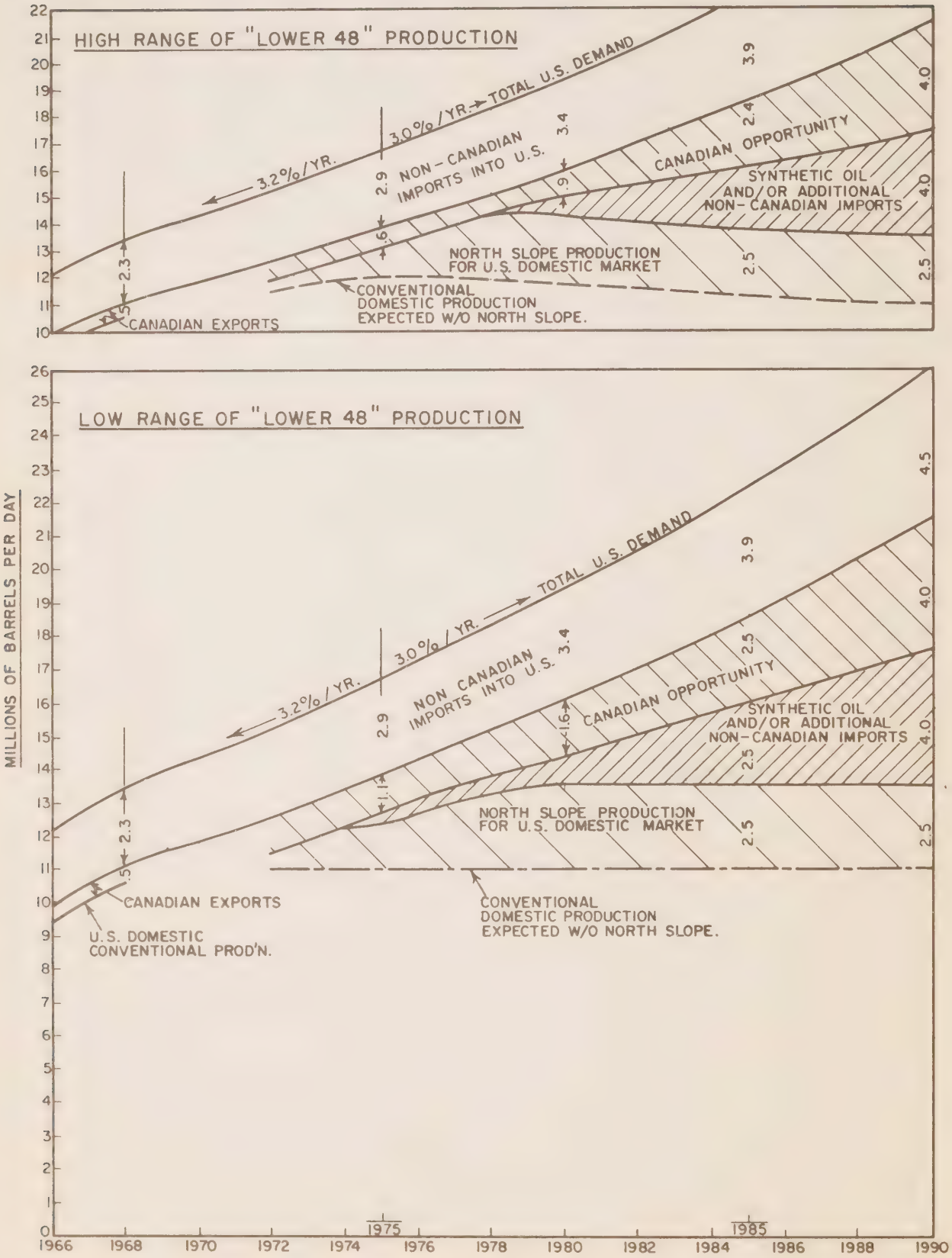
When these factors are considered, it is evident that a forecast of 11 to 12 MMB/D domestic production rate excluding Alaska North Slope is optimistic.

Currently forecasts project Alaska North Slope production to begin supplying 400 to 500 MB/D in 1972. A rate of increase of 200 to 300 MB/D per year thereafter appears reasonable, resulting in production of 1,200 MB/D in 1975 and 2,500 MB/D by 1979, assuming always that sufficient reserves (minimum 20 billion barrels) are proven.

On this basis and using the range of 11-12 MMB/D in production from the "lower 48", Canadian exports to the United States for 1975 will range between 1,100 MB/D and 600 MB/D. It is not possible to predict Canadian exports more precisely until answers to questions concerning United States productive capacity and import policy are available.

FIGURE VI — 2

U.S. CRUDE & NGL DEMAND/SUPPLY AND CANADIAN EXPORT OPPORTUNITY ANALYSIS



Using the assumptions made about United States demand, total production, and imports of overseas oil, the growing deficiency can be calculated. The following tabulation shows the possible ranges under three assumptions:

UNITED STATES PETROLEUM DEMAND AND SUPPLY
(MMB/D)

	1968	1975	1980	1985	1990
North Slope Production of 1 MMB/D					
Total Demand	13.4	16.7	19.4	22.5	26.0
Less:					
Imports from Overseas	2.3	2.9	3.4	3.9	4.5
Domestic Production[1]	10.6	11.0-12.0	11.0-12.0	11.0-11.6	11.0
North Slope Alaska Production	—	1.0	1.0	1.0	1.0
Supply Deficiency[2]	0.5[3]	1.8- 0.8	4.0- 3.0	6.6- 6.0	9.5
North Slope Production of 2.5 MMB/D (See Figure VI-2)					
Total Demand	13.4	16.7	19.4	22.5	26.0
Less:					
Imports from Overseas	2.3	2.9	3.4	3.9	4.5
Domestic Production[1]	10.6	11.0-12.0	11.0-11.7	11.0-11.3	11.0
North Slope Alaska Production	—	1.2	2.5	2.5	2.5
Supply Deficiency[2]	0.5[3]	1.6- 0.6	2.5- 1.8	5.1- 4.8	8.0
North Slope Production of 4.0 MMB/D					
Total Demand	13.4	16.7	19.4	22.5	26.0
Less:					
Imports from Overseas	2.3	2.9	3.4	3.9	4.5
Domestic Production[1]	10.6	10.8-11.8	10.3-10.9	10.2-10.5	10.1
North Slope Alaska Production	—	1.4	3.2	4.0	4.0
Supply Deficiency[2]	0.5[3]	1.6- 0.6	2.5- 1.9	4.4- 4.1	7.4

[1] Excluding North Slope Alaska.
[2] To be supplied from Canadian and other sources.
[3] The 1968 supply deficiency is entirely supplied by Canadian exports.

Having examined the United States petroleum demand and supply situation and having determined that there will be a large emerging supply deficiency to which Canadian exports could make a substantial contribution (see Figure VI-2), the discussion now turns to the Canadian petroleum demand and supply situation.

CANADIAN PETROLEUM DEMAND AND SUPPLY

The basic approach followed here is to present two cases. Case A is limited to production from the Western Canada Sedimentary Basin, which includes the presently producing areas in Canada. It assumes no significant production of crude oil from Canada's frontier areas, or further major developments of the Athabasca tar sands. Case A anticipates an accelerated growth of the oil industry over the forecast period, assuming a 3.5 per cent per year increase in exploratory effort and a continuation of the average success ratio experienced over the past five years.

Case B assumes that Canada's hydrocarbon production would satisfy all market opportunities that will become available. Unlike Case A, it goes beyond production from the Western Canada Sedimentary Basin and assumes significant discoveries and production in Canada's frontier areas. It is further backed by possible large new tar sand developments in Canada.

Although there were three cases of Alaska North Slope production considered in the foregoing discussion, the "middle" case of 2.5 million barrels per day of Alaska North Slope production alone has been selected in order to simplify the presentation in the subsequent determination of Canadian opportunity to export oil to the United States. It is recognized that actual maximum Alaska North Slope production may be more or less than 2.5 million barrels per day. The impact of such higher or lower levels on the opportunity for Canadian production can be determined by interpolation.

Within Case A and Case B some alternatives are presented relating to the level of overseas imports into Canada. These levels, which are listed as sub-cases to Case A and Case B, are:

1. continuation of Canada's present domestic policy (maintaining present oil policy line);
2. imports from overseas at rates similar to those in effect in the United States (17.3 per cent of domestic demand); and,
3. imports from overseas of 10 per cent of Canadian domestic requirements.[4]

Sub-case (1) is based on the assumption that there would be no change in the present oil policy in Canada. It assumes that the present market west of the Ottawa Valley would continue to be reserved for Canadian crude oil. It further assumes that transfers and imports into the protected western area would be constant at the 1966 level of 22.2 and 41.5 MB/D respectively.

The assumption in sub-case (2) is that Canada's overseas imports would be reduced to 17.3 per cent of domestic demand. This is the rate which has been used for United States overseas imports in the determination of the

[4] This sub-case was established to show the maximum possible market for petroleum to be supplied from Canadian production, and hence to provide a "limit test" for comparison with projections of maximum Canadian productive capacity.

apparent supply deficiency in the United States. The reduction of overseas imports into Canada was assumed to be gradual, declining from an estimated 50 per cent of Canadian domestic demand in 1970 to 17.3 per cent in 1978. From 1978 onward, overseas imports would be stabilized at the 17.3 per cent level.

Under sub-case (3), it is assumed that overseas imports into Canada would decline from 50 per cent of Canadian domestic demand in 1970 to 10 per cent by 1980, as a minimum considering the needs for imported specialty crudes and products. The level of 10 per cent overseas imports would then be maintained over the balance of the forecast.

In the interests of simplicity, the discussion of Canadian imports within Cases A and B will only deal with sub-case (1), the continuation of Canada's present domestic policy, although the results associated with the other two sub-cases are presented in Appendix C Tables 17A and 17B.

Case A — Canadian Oil Production Limited to Western Canada Sedimentary Basin Reserves

Total Canadian demand for crude oil and equivalents will increase from about 1,200 MB/D in 1966 to about 2,960 MB/D in 1990, based on projections of refined petroleum products demand (see Table 17A). Crude oil imports into Canada to meet refinery requirements east of the Ottawa Valley will increase from about 600 MB/D to 1,445 MB/D over the forecast period. Domestic production is assumed to increase faster than the growth in productive capacity. By 1980, and for the remainder of the forecast period, production is equivalent to the productive capacity that could be supported by current reserves and the level of exploratory effort and success ratios referred to earlier. On this basis, production will increase from about 1,000 MB/D in 1966 to 4,115 MB/D in 1990. In Case A, therefore, export levels, which are the balancing factor, will increase from 386 MB/D in 1966 to 2,600 MB/D in 1990. In the early years, these export levels conform to the guidelines of the existing United States Oil Import Program.

CANADIAN PETROLEUM DEMAND AND SUPPLY, Case A
(MB/D)

	1966	1975	1980	1985	1990
Canadian Demand	1,203	1,678	2,036	2,444	2,959
Plus Exports	386	1,100- 600	1,600- 900	2,100-1,970	2,600
Less Imports	598	832	1,009	1,204	1,444
Production	1,013	1,946-1,446	2,627-1,927	3,340-3,210	4,115
Inventory Change	22	—	—	—	—

The levels of Canadian production under Case A will fall short of the "assumed potential to produce" during the period up to and including 1980, if crude oil imports into Canada continue as under the present policy. By 1985, however, the potential to produce will probably be the limiting factor.

This expected development can be observed by reference to the following tabulation.[5] "Assumed potential to produce" is here defined to be the estimated production level under sub-case (3) which limits imports into Canada at 10 per cent of Canadian demand.

	1975	1980	1985	1990
		(MB/D)		
Production				
Sub-Case (1).....	1,946-1,446	2,627-1,927	3,340-3210,	4,115
Sub-Case (2).....	2,275-1,775	3,284-2,584	3,340-3,210	4,115
Sub-Case (3).....	2,275-1,775	3,300-2,733	3,340-,3210	4,115

From this tabulation, it is evident that 1980 production under sub-case (1) of 2,627-1,927 MB/D is considerably below the estimated production under sub-case (3) (or the "assumed potential to produce") of 3,300-2,733 MB/D in that year. Thus, imports would appear to be the limiting factor. The same would hold true for 1975. However, in 1985 and 1990 respectively, the production levels for all sub-cases are the same. In these years, therefore, productive capacity would appear to be the limiting factor.

Case B — Canadian Oil Production from the Western Canada Sedimentary Basin and "Frontier Area" Reserves

In the Case B analysis, both domestic demand and import levels are the same as in Case A. Canadian opportunity to export oil to the United States (100 per cent of the 'supply deficiency' in 1968) is assumed to grow substantially in absolute terms, but to decline to 50 per cent of the 'supply deficiency' by 1990.

On this basis, exports increase from about 386 MB/D in 1966 to 4,000 MB/D in 1990. Based on these estimated levels of demand, exports and imports, production will increase from about 1,000 MB/D in 1966 to 5,515 MB/D in 1990, as summarized below:

CANADIAN PETROLEUM DEMAND AND SUPPLY, Case B
(MB/D)

	1966	1975	1980	1985	1990
Canadian Demand.....	1,203	1,678	2,036	2,444	2,959
Plus Exports.....	386	1,100- 600	1,600- 900	2,500	4,000
Less Imports	598	832	1,009	1,204	1,444
Production.....	1,013	1,946-1,446	2,627-1,927	3,740	5,515
Inventory Change.....	22	—	—	—	—

In Case B, market limitations, which are partly caused by Canadian import levels, are the major factors influencing Canadian production. This expected development can also be observed by reference to the following

[5] Taken from Appendix C, Table 17A(1) and 17A(2).

tabulation.[6] "Assumed potential to produce" of 3,300-2,733 MB/D in 1980 (represented by production levels under sub-case (3) which assume imports equal to only 10 per cent of domestic demand) is much higher than production under sub-case (1) in 1980.

	1975	1980	1985	1990
		(MB/D)		
Production				
Sub-Case (1).....	1,946-1,446	2,627-1,927	3,740	5,515
Sub-Case (2).....	2,275-1,775	3,284-2,584	4,520	6,447
Sub-Case (3).....	2,275-1,775	3,300-2,733	4,700	6,663

In and beyond 1980, however, the maximum opportunity to export to the United States is reached (that is 900 to 1,600 MB/D in 1980 increasing to 4,000 MB/D in 1990). Therefore, beginning in 1980, the level of overseas imports becomes the only remaining variable affecting Canadian production.

OVERALL OBSERVATIONS

The potential of Canada's frontier areas, earlier itemized as the West Coast, the Arctic Islands and offshore, Hudson Bay, the Atlantic offshore, the Gulf of St. Lawrence and the Gaspe regions, were reviewed and the ultimate recoverable reserves estimated. It is conservatively estimated that there could be 90 billion barrels of recoverable reserves found in these areas.

It is assumed that development of the frontier areas would probably inhibit development of the Western Canada Sedimentary Basin. The difference in production for that Basin could be as much as 1 million barrels daily between Case A and Case B. This reduction is considered a logical consequence of the diversion of effort to the frontier areas if these show promise for substantial production.

Early in 1969 the Canadian Petroleum Association issued an estimate of the ultimate recoverable oil reserves for Canada as being 120.8 billion barrels of crude oil plus 19.6 billion barrels of NGL. Of this total, the Western Canada Sedimentary Basin is allocated 45 billion barrels of crude plus 7.5 billion barrels of NGL for a total of 52.5 billion barrels.

Allowing for cumulative production to 1990 under Case A and a 10-year ratio of reserves to production in 1990 implies that about two-thirds of the 52.5 billion-barrel ultimate reserves will be found by 1990.

For Case B, under similar considerations but allowing for a diversion of exploratory effort from the Western Canada Sedimentary Basin to the frontier areas, it is implied that about 20 per cent of the remaining 87.5 billion barrels of crude and NGL will be found by 1990.

[6] Taken from Appendix C, Table 17B(1) and 17B(2)

VII

NATURAL GAS SUPPLY IN CANADA

The characteristics of natural gas supply and supply arrangements are significantly different from those for oil. This chapter, in addition to showing projections of production rates, notes the general supply arrangements and some of the matters unique to gas supply and marketing. The forecast of natural gas supply is presented along with the usual cautionary remarks concerning forecasting.

Since Canada's gas production can be calculated by adding domestic consumption and exports and deducting imports, these parameters are evaluated. Because gas is exported only to the United States, this study required a forecast of United States supply and demand to determine the extent of any supply deficiency in that country over the forecast period.

The general conditions of Canada's participation in the United States gas market are also reviewed.

PERTINENT BACKGROUND INFORMATION ABOUT NATURAL GAS

The following discussion deals with natural gas as a separate commodity. However, it should be noted that in many ways gas is indistinguishable from oil and in certain situations inseparable from it. This is particularly true in the exploration, drilling and to a lesser extent, the development phase. Only in the most general sense is it possible to suggest that exploration can be directed towards finding gas as distinct from finding oil. The usual uncertainties associated with oil exploration also apply to gas exploration, i.e. in what areas will reserves be found and thereby pre-empt markets and transportation investment capital? What will be the magnitude of the reserves found? Can they be produced and marketed at prices competitive with other energy sources?

These considerations have to be evaluated in the light of some distinctive features of natural gas as a commodity.

Natural gas is a relatively difficult and expensive product to transport and store. In contrast to oil and its products, gas is stored after production only in a limited way relative to production and consumption. By any given

means of transport, the cost of moving a million Btu's is substantially higher for gas than for oil. In respect of pipe lines, gas requires much higher investment in pipe and compressor facilities, and higher operation costs for compression and for storage, where the latter is used. Whereas ocean tankers provide the lowest cost transportation for oil, ocean transport of gas has just recently become technically feasible, and with the expensive ancillary equipment on shore necessary for liquefaction, cryogenic storage and revaporization of LNG, results in total transport costs substantially greater than those for oil. The economic and technical problems associated with LNG facilities have so far prevented the movement of major quantities of natural gas from overseas sources to North America. Overseas gas imports are thought unlikely to grow to major importance for the supply of base load demand during the forecast period. In the gas industry long term contractual arrangements are normal, whereas in the oil industry short term contracts are usual.

Both in Canada and the United States gas is subject to much more formal regulation than is oil. Both countries regulate exports and imports and interprovincial or interstate transmission of gas. Distribution is regulated by Provincial or State authorities. Wellhead prices are not now under formal regulation in Canada. In the United States, federal regulation applies to wellhead price of gas moving in interstate commerce.

Notwithstanding Canadian controls on exports, the United States gas price structure affects that in Canada. Since exports take a large proportion of Canadian gas production, and since exports are expected to increase proportionately, the linkage between gas prices in the two countries will continue.

While some areas are predominantly productive of gas, oil and gas are generally found near one another, if not actually intermingled within the same reservoir. Thus, gas as well as oil, may be found in the potential "frontier areas" as is the case in the Alaska North Slope. Major discoveries of gas in any of these areas would greatly alter the present gas supply and transportation systems. Such gas dicoveries would have to be large to overcome the inherently expensive operations as well as the transportation cost features already mentioned.

AVAILABILITY OF UNITED STATES MARKETS TO CANADIAN NATURAL GAS

The following discussion of United States markets available to Canadian gas exports touches upon major regulatory and political considerations, then proceeds to an analysis of supply and demand balances.

United States regulatory policies are administered by the Federal Power Commission in its control over pricing, interstate gas transportation, and imports and exports of gas. In the past the FPC has allowed imports from Canada, following demonstration of United States need, adequate Canadian supply and inability of domestic United States sources to supply the market or incremental market at competitive prices. It is assumed that volumes of imports from Canada will increase up to 15 per cent of United States domestic

gas demand by 1990. Canadian exports to the United States presently account for about 3 per cent of United States domestic demand.

The synthetic gas industry, while having made much progress, is not yet competitive even in areas remote from natural gas supply and adjacent to coal supplies. As a matter of policy the United States could limit its dependency on imported gas from Canada by encouraging the synthetic gas industry.

These are only some of the regulatory-political considerations in the United States scene which could have an impact on Canadian gas exports.

For purposes of selecting a United States gas demand-supply estimate for this study, gas demand was based upon the Future Requirements Committee Report of June 1967.[1] Gas supply was estimated from a regional analysis of the gas potential and checked against the Potential Gas Committee's[1] estimates of June 1969. It is assumed that the difference between United States demand and United States supply (including estimated movements from Alaska), will be met by overseas LNG imports for peak-shaving, synthetic gas, and gas imports from Canada and Mexico. The following table indicates the size of the United States gas supply deficiency.

UNITED STATES GAS DEMAND AND SUPPLY
(Trillions of Cubic Feet)

	1966	1975	1980	1985	1990
Domestic Demand	17.7	25.5	28.6	32.0	36.0
Less Estimated Domestic Conventional Supply	17.2	23.8	22.7	22.6	22.0
Alaska Supply		0.3	1.0	1.5	2.0
Apparent U.S. Gas Supply Deficiency	0.5	1.4	4.9	7.9	12.0

Some portion of the apparent United States gas supply deficiency may be met from presently unforeseen increases in the "lower 48 states", perhaps resulting from nuclear stimulation or from extraordinary findings in the deeper areas of the Outer Continental Shelf.

Gas movement from Alaska is not likely to become significant before 1975. The large reserves necessary to justify the expensive large diameter, long distance pipe line, and the financing and the construction of such a project will, it is assumed, delay gas delivery until about that time. By then United States gas demand will be of such size that anticipated Alaska gas shipments and Canadian gas surplus will both find a ready market.

[1] Both the Future Requirements Committee and the Potential Gas Committee operate under the general auspices of the Gas Industry Committee sponsored by the American Gas Association, the American Petroleum Institute and the Independent Natural Gas Association of America.

It must, of course, be understood that this projection does not presume any specific regulatory decision in particular cases by either United States or Canadian authorities. It is simply assumed that Canadian policies will continue to enable gas surplus to Canadian requirements to be exported at appropriate prices, and that United States policy will continue to enable imports from Canada to be made when market requirements can be economically met by such gas.

It is obvious that energy demand and supply are brought into balance over relatively short time spans. If gas supply is not available to meet a given energy demand or market, that particular market will convert to an alternate fuel source and may be permanently lost as a gas market. Therefore, very basic to the forecast of gas demand is the assumption of the timely development of gas supply to meet the demand.

CANADIAN IMPORTS

Imports of gas into Canada, which were small in relation to Canadian markets (7 per cent) in 1966, are expected to remain relatively constant in physical quantity, decreasing in relative terms. The increasing demand in the United States and the forecast surplus in Canada weigh against the probability of increased imports.

CANADIAN GAS PRODUCING CAPABILITY

Currently Canada's gas reserves are mainly located in the Western Canada Sedimentary Basin where they have been accumulated in a series of discoveries in the course of an exploratory program which, although active, was primarily directed toward finding oil. Future gas reserves growth could continue to occur in line with historical trends, or could occur in the frontier areas as new major discoveries, i.e. of the Prudhoe Bay type. The first type of reserves growth permits an analytical assessment of future gas supply. The second type of growth is not susceptible to the usual analytical approach. However, it would appear that very large reserve pools will have to be found in the Canadian frontier areas to permit marketing of such gas reserves under foreseeable economic conditions.

It has not been possible to analyze possible reserves growth in the frontier areas based upon forecast drilling activity, or any other parameter. Ultimate reserves based on volumes of sediments have been estimated.

Gas supply estimates have therefore been developed according to two basic approaches; Case A and Case B.

In Case A, the 5-year average reserve appreciation in relation to exploratory effort in the Western Canada Sedimentary Basin was projected into the future, assuming a 3.5 per cent yearly increase in exploration activity. No discoveries in Canadian frontier areas were assumed in this analysis. Case A may be considered as a conservative supply forecast based on an extension of historical trends applied to proved productive areas.

Case B, on the other hand, assumes that large Prudhoe Bay type structures will be found in Canada's frontier areas. None of these areas are as yet productive of gas or oil, but they appear to have great promise.

Case A — Canadian Gas Production Limited to Western Canada Sedimentary Basin Reserves

Under Case A, exports are limited by the gas resources available in the Western Canada Sedimentary Basin, as indicated by the following tabulation. Gross production is estimated to increase from about 1,340 Bcf in 1966 to over 4,900 Bcf in 1990.

CANADIAN NATURAL GAS DEMAND AND SUPPLY, Case A[2]
(Bcf)

	1966	1975	1980	1985	1990
Gross Production	1,342	2,897	3,531	4,180	4,942
Less Shrinkage, Plant Use, etc.	253	485	551	647	752
Net Production	1,089	2,412	2,980	3,533	4,190
Plus Imports	45	45	45	45	45
	1,134	2,457	3,025	3,578	4,235
Less Domestic Demand[3]	702	1,292	1,666	2,129	2,609
Gas Available for Export	432	1,165	1,359	1,449	1,626

[2] See Appendix C, Table 18A.
[3] Including pipe line fuel and losses on both domestic and export shipments.

After allowing for shrinkage and plant use, net production will increase from about 1,089 Bcf in 1966 to about 4,200 Bcf in 1990. Imports are expected to remain constant at 45 Bcf per year over the forecast period. Canadian demand for natural gas will increase about 3.75 times over the forecast period reaching 2,600 Bcf by 1990. After allowing for production required to meet domestic demand, additional production will be available for gas exports to quadruple between 1966 and 1990.

Case B — Canadian Gas Production from the Western Canada Sedimentary Basin and "Frontier Area" Reserves

Domestic demand, except for pipe line fuel, is the same under Cases A and B. Exports to the United States were assumed to increase to an upper limit of 15 per cent of United States demand (in 1990, exports are 5,400 Bcf, or 15 per cent of United States demand of 36 trillion cubic feet).

In order to meet domestic and export demand, gross production will have to increase from over 1,340 Bcf in 1966 to nearly 9,600 Bcf in 1990, after allowing for shrinkage and plant use, as tabulated below:

CANADIAN NATURAL GAS DEMAND AND SUPPLY, Case B[4]
(Bcf)

	1966	1975	1980	1985	1990
Domestic Demand[5]	702	1,295	1,703	2,231	2,777
Imports	45	45	45	45	45
Exports	432	1,275	2,300	3,700	5,400
Required Production	1,089	2,525	3,958	5,886	8,132
Shrinkage, Plant Use, etc.	253	496	716	1,059	1,463
Gross Production	1,342	3,021	4,674	6,945	9,595

[4] See Appendix C, Table 18B.
[5] Including pipe line fuel and losses on both domestic and export shipments.

In Case B, therefore, it was assumed that there is no limitation on gas production imposed by levels of established reserves.

The reasonableness of these projections of gross production under Cases A and B must be assessed in light of expected ultimate recoverable gas reserves.

Early in 1969 the Canadian Petroleum Association published its estimate that Canada's ultimate recoverable natural gas reserves would be 725 Tcf of which the Western Canada Sedimentary Basin is expected to yield 270 Tcf.

The supply component of Case A depends almost entirely on this Region. The cumulative production under that Case, plus the necessary reserves to protect Canadian demand along with a 20-year protection for the 1990 export level, imply that approximately two-thirds of the 270 Tcf of ultimately recoverable reserves will have been found by 1990.

The CPA estimate for the remainder of Canada (the frontier areas) is 455 Tcf of gas. On the same basis as above Case B suggests that the frontier areas should be developed to approximately one-third of ultimate reserves by 1990, making some allowance for displacement of exploration activity from the established areas. Such a level of development does not appear unrealistic in relation to the large supply requirements foreseen in the United States.

VIII

COAL AND COKE SUPPLY IN CANADA

Canadian coal production is projected to increase from over 11 million short tons in 1966 to over 71 million tons in 1990. Currently, Western Canada accounts for nearly 60 per cent of Canadian production. Over the forecast period, Eastern Canadian production is expected to decline in both absolute and relative terms as shown below:

COAL PRODUCTION IN CANADA BY SOURCE[1]
(Millions of Short Tons)

	1966	1975	1990
Eastern Canada			
Nova Scotia	3.9	3.0	2.7
New Brunswick	0.9	0.5	0.3
Total Eastern Canada	4.8	3.5	3.0
Western Canada			
Saskatchewan	2.1	4.0	14.1
Alberta	3.4	11.6	32.4
British Columbia	1.1	7.5	21.8
Total Western Canada	6.6	23.1	68.3
Total Canada	11.4	26.6	71.3

[1] Details of coal production by class and region are shown in Appendix C, Table 20.

The bulk of coal production currently is bituminous although the relative importance of this class of coal is projected to decline by 1990. This change should be accompanied by an increase in relative importance of sub-bituminous coal.

COAL PRODUCTION IN CANADA BY TYPE
(Millions of Short Tons)

	1966	1975	1990
Bituminous	6.7	15.6	32.5
Sub-bituminous	2.6	7.0	24.7
Lignite	2.1	4.0	14.1
Total Coal Production	11.4	26.6	71.3

COAL PRODUCTION IN EASTERN CANADA

The level of coal production in Eastern Canada is determined mainly by government policy and hence is removed from normal interfuel competition. The development of an acceptable time schedule for phasing out and for stabilization of production depends on the success of avoiding unnecessary hardships to the dependent communities. The assumptions used are:

1. one new mine would be brought into production before 1975, producing perhaps 2 million tons annually;
2. coal from the new mine would replace imported coal for coking purposes; and,
3. production from the existing mines would decrease and eventually stabilize at about 1 million tons per annum.

COAL PRODUCTION IN WESTERN CANADA

Saskatchewan lignite and Alberta sub-bituminous production are generally related to demand within the Western Provinces for generation of electricity. In contrast, the production of bituminous coal in Alberta and British Columbia will in the main result from export demand. Production of the quantities forecast should provide significant economic stimulus to the producing regions and to the transportation sector.

EXPORTS OF COAL FROM ALBERTA AND BRITISH COLUMBIA

Coal exports from Alberta and British Columbia appear to be entering a phase of major expansion, as indicated below:

EXPORT OF COAL
(Millions of Short Tons)

	1966	1975	1990
Alberta	0.7	4.4	7.5
British Columbia	0.4	7.0	13.0
Total	1.1	11.4	20.5

In the future, Canadian coal for export will be produced in Alberta and British Columbia. The small present export from New Brunswick is expected to disappear as a result of conversions to oil by coal consumers in the state of Maine.

IMPORTS OF COAL INTO ONTARIO AND QUEBEC

The large projected exports will continue, over the forecast period, to be exceeded by imports from the United States mainly into Ontario. Nevertheless, the adverse balance should diminish during the latter part of the forecast period.

An increase in imports is expected to supply demand in Ontario and Quebec for industrial and thermal generation use. Imports, which were 16.9 million short tons in 1966, will increase to 23.9 million in 1990. This represents an average annual increase of 1.5 per cent.

IX

ELECTRICITY SUPPLY IN CANADA

Electricity supply in Canada traditionally has come from hydro sources. As recently as 1966, 82 per cent of all generation was hydro. In spite of very large hydro developments that are presently underway on the Churchill, Nelson, Columbia and Peace Rivers, hydro generation as a share of total generation will diminish to 44 per cent in 1990. Nuclear and to a lesser extent conventional thermal generation will increase in relative importance through 1990. The following tabulations summarize the projected supply pattern for electricity. Because electricity cannot be stored, supply is co-ordinated very closely with demand. When demand occurs, supply is provided. The average annual growth rate in total electrical energy demand of 5.9 per cent to 1990 is probably conservative.

ELECTRICITY SUPPLY IN CANADA
(Thousands of GWH)[1]

	1966	1975	1990
Required Net Generation			
Hydro	129.8	191.3	277.7
Thermal	28.3	79.9	341.6
Total	158.1	271.2	619.3
Required Net Generation			
Utilities	126.0	237.4	582.6
Industries	32.1	33.8	36.7
Total	158.1	271.2	619.3

[1] One GWH equals 1,000,000 kilowatthours (KWH).

SOURCES OF ELECTRICITY SUPPLY IN CANADA
(Percentages)

	1966	1975	1990
Hydro	82	71	44
Nuclear	—	6	32
Coal	10	17	17
Oil	2	2	3
Natural Gas	3	2	3
Industrial Thermal	3	2	1
	100	100	100

The electricity supply industry is highly capital intensive. The installed generating capacity, which is tabulated below is therefore of significant interest.

ESTIMATED INSTALLED GENERATING CAPACITY BY PROVINCE
(MW)

	Actual	Estimated	
	1966	1975	1990
Newfoundland and Labrador	544	5,300	8,800
Prince Edward Island	58	100	340
Nova Scotia	626	1,100	2,400
New Brunswick	679	1,200	3,300
Québec	10,566	13,000	33,300
Ontario	8,790	19,100	43,500
Manitoba	1,363	2,200	5,100
Saskatchewan	996	2,400	6,500
Alberta	1,491	3,300	10,500
British Columbia	3,741	7,200	18,800
Yukon and N.W.T.	79	140	340
	28,933	55,040	132,880

This chapter summarizes projected electricity supply by type of generation and by province. The basis for projecting electricity supply is detailed in Appendix B. Appendix C Table 19 gives the detailed electricity demand and supply forecast for Canada. That table also includes a detailed estimate of the installed capacity for each province.

ELECTRICITY SUPPLY BY TYPE OF GENERATION BY PROVINCE

Electricity supply by type of generation was studied for each province. The forecasts of demand by province, which are discussed below, were generally above the historical total energy trend line in the early years of the forecast period and dropped below it in the later years. These trends took account

of the present high rates of expansion in the economy coupled with a later moderation due to a lesser growth rate in population when compared with the historical period.

Newfoundland

It was assumed that Lower Churchill Falls would be developed and that DC cables would be installed across the Strait of Belle Isle. However, if this course of action is in fact followed these Labrador sites could not be economically integrated into the Newfoundland system until about 1980. If, on the other hand, this course of action were not followed, the equivalent thermal generation would be shifted out of Quebec into Newfoundland assuming that major Churchill River power sites would be developed in any event. The development program assumes that oil-fired generation and hydraulic peaking generation is added prior to 1980 and that further additions of hydraulic peaking and gas turbines are installed after the Lower Churchill development.

The system peak load will not increase sufficiently by 1990 for the economic installation of nuclear units.

The supply of Upper Churchill Falls power as presently contracted by Hydro-Quebec is shown as a transfer out from Newfoundland of 30,000 GWH annually. The quoted annual output is about 32,000 GWH and the interprovincial transfer shown allows for Labrador demand as well as losses.

Prince Edward Island

All additional energy requirements are assumed to be met from oil-fired steam generation.

Nova Scotia

Most of Nova Scotia's additional generation is assumed to be coal-fired. The Point Tupper unit (oil-fired) and Glace Bay unit (coal-fired) provide process steam as well as electric power. Fuel for production of process steam is not included.

It was assumed that Nova Scotia and New Brunswick will continue in the Maritime Power Pool and that effective co-ordination with Quebec and Maine would enable the Pool to install nuclear units by 1985.

In 1975 a transfer of 546 GWH is shown from New Brunswick to Nova Scotia. This represents part of the Quebec surplus which cannot be absorbed in New Brunswick.

New Brunswick

Coal and diesel generation are assumed to remain at present levels with additional generation being provided by oil-fired units, hydraulic generation and nuclear generation, which it is assumed would be installed in conjunction with Nova Scotia starting in 1985.

An export of 960 GWH per year from New Brunswick to Maine has been allowed for from 1970-71 to 1973-74, and transfers of surplus energy from Québec during the period from 1971-72 to 1975-76 have been included.

Québec

There is still considerable hydraulic potential available in Quebec. It is assumed that, after the Churchill Falls development is complete, further hydraulic plants will be built on the Manicouagan and Outardes Rivers and in the James Bay area. It is assumed that, starting in 1983, nuclear generation will be added to supply base load, and oil-fired generation to supply peaking power.

Surplus energy will be available from the Churchill Falls development for about a decade from 1972 and these surpluses will largely be transferred to Ontario and New Brunswick where they will displace fossil fuels. The transfers shown include Ontario Hydro's existing Quebec contracts, the last of which expire by or before 1976, and the Cedar Rapids contract of 490 GWH which is transferred to Ontario and is then exported from Ontario to the United States.

Ontario

The additional generation in Ontario will be almost wholly thermal and is assumed to be largely nuclear after 1978. Ontario has about 400 MW total of gas turbine generation and it is assumed that this will operate at about 2½ per cent annual capacity factor using light oil as the fuel source.

Transfers into Ontario include the Quebec surpluses and the Manitoba contract which runs from 1971 to 1977.

Manitoba

The forecast assumes that cooperation between the power utilities in Manitoba and Saskatchewan will continue; that the Nelson River developments will be continued; and that thermal generation (based on Saskatchewan lignite) will provide for peaking and additional energy as required.

Transfers allow for presently contracted sales to Ontario Hydro and the power sales between Manitoba Hydro and Saskatchewan Power Corporation. The supply of power to Flin Flon, Manitoba from the Churchill River Power Company in Saskatchewan is shown as a transfer.

Saskatchewan

The additional generation in Saskatchewan will be largely thermal. It is assumed that production from natural gas will increase to 1,200 GWH, that generation from diesel and heavy oils will remain constant and that two-thirds of the remaining generation will be from lignite in Southern Saskatchewan and one-third from sub-bituminous coal in the western part of Saskatchewan.

Alberta

Some additional hydraulic generation is assumed to come in at Bighorn in 1973 with the remaining requirements being met by thermal generation. Coal and natural gas are both used for power generation in Alberta. It is assumed that 62 per cent of Alberta's thermal electric power requirements will be met from coal, 36 per cent from natural gas and 2 per cent from oil over the period of the forecast. In the case of natural gas consumption, it is assumed that half the electricity will be produced in gas turbines and half in gas-fired steam units.

British Columbia

Considerable hydro resources remain to be developed in British Columbia. The forecast assumes that the available hydro sites on the Peace and Columbia Rivers will be developed but not the Liard and Fraser sites. Some hydro sites will probably be redeveloped as peaking power sites, but this will not change significantly the amount of hydro energy available. The additional energy requirements are assumed to be provided from mine mouth coal-fired plants in southern British Columbia.

Nuclear generation does not appear to be competitive on the mainland. It is assumed that by 1985 it will be feasible to install nuclear capacity on Vancouver Island to meet base load requirements.

Yukon and Northwest Territories

It is assumed that most of the additional electric power required will be provided by electric generators using light oil. Because of the lack of knowledge of what loads might develop and their location, any supply forecast for this area is relatively uncertain.

CONVENTIONAL THERMAL GENERATION BY UTILITIES

Thermal generation by utilities is expected to increase at an annual rate of 11.6 per cent over the forecast period. The main portion of this growth will be nuclear. Conventional thermal generation will also register substantial growth as shown in the following tabulation:

CONVENTIONAL THERMAL GENERATION BY UTILITIES
(Trillions of Btu's)

	Actual	Estimated	
	1966	1975	1990
Coal	181	522	1,223
Oil	37	52	192
Natural Gas	64	87	234
Total	282	661	1,649

In actual quantities, the volumes for thermal generation by utilities involved are as follows:

		Actual	Estimated	
	Units	1966	1975	1990
Bituminous Coal	MM tons	5.1	13.1	21.6
Sub-bituminous Coal	MM tons	1.7	6.5	24.3
Lignite Coal	MM tons	1.1	3.7	13.9
Diesel Oil	MM bbls.	0.9	1.1	2.4
Light Oil	MM bbls.	0.2	0.6	0.9
Heavy Oil	MM bbls.	4.8	6.8	27.5
Natural Gas	MMMcf	64.3	86.7	233.9

NUCLEAR THERMAL GENERATION BY UTILITIES

Nuclear generation was assumed to be all of the CANDU type using natural uranium fuel. The burn-up of nuclear fuel in Canada is estimated to increase from 3 tons of U_3O_8 in 1966 to 343 tons in 1975 and 3,975 tons in 1990 (see Appendix C Table 19). In addition to actual fuel burn-up nuclear generation requires a large fuel inventory in the reactor and in the various stages from the mine to the plant.

CUMULATIVE FUEL INVENTORY IN CANDU NUCLEAR UNITS

Year	Installed Capacity MW	Fuel Inventory Tons of U_3O_8
1975	2,500	700
1980	6,500	1,600
1985	15,500	3,600
1990	31,000	7,200

Proposals have been made for the development of a uranium enrichment plant in Canada which would require two to three million kilowatts of generating capacity operating almost continuously. No provision has been made for any such load in this forecast.

Appendix A

ASSUMPTIONS OF THE STUDY

A number of assumptions were made as to the political, economic, technological and social environment over the forecast period. Assumptions were also made concerning future population and number of households, which have a direct impact on energy demand in the residential/commercial and private automobile transportation sectors. Various specific assumptions relevant to energy supply and demand are identified in the main text.

1. *Political*

   (a) there will be no major war, but a high level of military preparedness in major countries will be likely;

   (b) overseas petroleum supplies will be available to North American markets over the long term despite possible temporary interruptions;

   (c) there will be no important change in national or international trading conditions affecting Canada, or the Canadian pattern of trade; and,

   (d) the present role of federal and provincial government in economic affairs will continue as will present national fiscal and energy policies.

2. *Economic*

   (a) there will be a continued high level of economic activity in Canada. Gross National Product will grow, in real terms, between 4.5 per cent and 5 per cent per year, although there may be short-term deviations from this trend;

   (b) the Canadian economy will continue to develop along present trends, depending increasingly on manufacturing and service industries;

   (c) there will be a continued high level of primary goods production in Canada; and,

(d) present Canadian inter-fuel price relationships will prevail, as will the relationships between various classes of service for each form of energy.

3. *Technological*

(a) no basically new energy form will come into general use during the forecast period. However, trends toward greater efficiency in transportation and utilization of energy will continue;

(b) there will be no new means of energy transportation;

(c) there will be an increasing trend toward use of electricity and natural gas as preferred energy forms; and,

(d) there will be intensified pressures for the reduction of air and water pollution.

4. *Social*

(a) *Population*

Between 1961 and 1966, the population of Canada increased from about 18.2 to 20.0 million, which was equivalent to an average growth rate of 1.9 per cent per year. Between 1966 and 1990, Canada's population is assumed to increase from 20.0 to 30.4 million (see Table A-1) equivalent to an average annual growth rate of 1.75 per cent per year. This growth rate is similar to the growth rate reflected in the Economic Council of Canada projections of total Canadian population.

In preparing this population estimate, consideration was given to the general assumption that Canada's economic growth will continue at a high level similar to the growth experienced between 1961 and 1966, and that the future pattern of migration between provinces will remain reasonably similar to that of this recent period.

Future rates of population growth for certain provinces have been modified slightly from those experienced in the recent past. Quebec, Ontario and British Columbia appear likely to grow more slowly, respectively, than in the 1961 to 1966 period. These provinces have been the main areas of settlement for immigrants. Net immigration will be lower than in the recent past, which accounts for the slower growth in these three provinces. The populations of the other provinces are assumed to grow at the historical rates of the 1961 to 1966 period.

(b) *Number of Households*

Trends in the number of households provide a significant yardstick for the potential demand for energy in the residential and commercial sector.

The number of persons per household declined markedly in Canada in recent years. In 1961, there were 4.0 persons per household, whereas by 1966 the level had decreased to 3.86. By 1990, only 3.46 persons per household are anticipated.[1]

The anticipated increase in population and further decline in the number of persons per household will result in a marked increase in the number of households. Between 1966 and 1990, the number of households is calculated to increase from 5.2 to 8.8 million (see Table A-1).

As a result of increasing urbanization, the pressure on land values in the cities, and change in the way of life, the recent trend in Canada has been towards more apartment living. The pace of construction of apartments has increased in recent years to the point where almost half of dwelling units constructed are in the form of apartments. The trend is evident in all provinces, although it is most marked in provinces which registered the fastest population growth. The assumption has been made that this trend will continue. Between 1966 and 1990, about 1,830,000 net new apartment dwelling units will be constructed. During this same period, about 1,870,000 single, double, and row-housing units will be constructed.

Specific assumptions made in calculating the number of apartments were based on the anticipated share that apartments would make up of total net new additions to the housing stock, as tabulated below by region:

APARTMENT TO TOTAL NEW DWELLING UNITS

Region	Per Cent
Atlantic Provinces	30
Québec	60
Ontario	50
Manitoba	40
Saskatchewan	35
Alberta	45
British Columbia	50
Yukon and N.W.T.	30

Because of its well established trend, the ratio for Quebec was deemed to remain relatively unchanged.[2]

[1] Persons per household for individual provinces differ significantly from the overall Canadian average as indicated in Appendix C, Table 2.

[2] Appendix C, Tables 4, 5, and 6 summarize estimated dwelling unit inventory by type over the forecast period.

TABLE A-1

POPULATION AND HOUSEHOLDS BY PROVINCES

Actual 1966—Estimated 1975 and 1990

(Thousands)

	Population			Households		
	1966	1975	1990	1966	1975	1990
Newfoundland	493	564	705	97	116	156
Prince Edward Island	109	117	132	25	28	32
Nova Scotia	756	791	852	185	204	243
New Brunswick	617	651	712	142	160	197
Québec	5,781	6,610	8,264	1,389	1,698	2,401
Ontario	6,961	8,393	11,463	1,877	2,331	3,351
Manitoba	963	1,044	1,194	259	289	348
Saskatchewan	955	1,008	1,102	260	281	321
Alberta	1,463	1,733	2,298	394	478	662
British Columbia	1,874	2,382	3,552	543	694	1,044
Yukon and N.W.T.	43	56	87	9	12	21
	20,015	23,349	30,361	5,180	6,291	8,776

NOTE: Figures may not add due to rounding.

SOURCE: Actual 1966 — Dominion Bureau of Statistics, Ottawa.
Estimated 1975 and 1990 — National Energy Board Staff, Ottawa.

(Appendix C, Tables 1, 2, and 3 provide more detailed information on population, persons per household and households, respectively, by province.)

Appendix B

METHODOLOGY DEVELOPED FOR ESTIMATING RESIDENTIAL ENERGY DEMAND, AUTOMOBILE TRANSPORTATION ENERGY DEMAND, AND ELECTRICITY SUPPLY

Residential Energy Demand

Published statistical data invariably fail to isolate residential demand. Apparent residential demand was calculated as follows:

(a) Unit consumption was estimated separately for "apartments" and for "other residential dwelling units", by type of fuel or energy. (See tabulation below).

(b) Unit consumption for "apartments" and "other residential dwelling units" was allocated to space-heating and water-heating, respectively.

(c) Unit consumption for "apartments" and for "other residential dwelling units" by type of fuel remained constant over time for each province.

(d) Consumption of wood and LPG was allocated entirely to "other dwelling units" (which includes single dwellings).

(e) Total consumption for "apartments" was calculated for each type of energy by multiplying unit consumption for apartments by the number of apartment units assigned to each type of fuel. The same procedure was used for calculating total consumption for "other residential dwellings". (Appendix C, Table 7 shows the number of "apartments" and "other residential dwelling units" by type of energy, by province, for each of the forecast years). The changing heating fuel distribution for Canada as a whole and by province (as summarized in Appendix C Table 7) was assessed as follows:

(i) estimates were made for fuels, such as coal and wood, the use of which is declining;

(ii) estimates were made of rates of penetration for fuels such as

natural gas, LPG, and electricity for heating, the uses of which are increasing;

(iii) the fuels presently dominant in particular regions (such as natural gas in the Prairie Provinces and oil in Quebec, Ontario and the Atlantic Provinces) were assumed to supply the remainder of the market.

In preparing these projections, it was further assumed that fuel consumption for apartment space-heating is 60 per cent of space-heating consumption in all "other dwelling units"; oil-heated and gas-heated apartments will use these respective fuels for water-heating (at assumed rates of 20 million Btu's per year); gas-heated "other dwelling" units will also use natural gas for water-heating, at assumed annual rates of 20 million Btu's in Manitoba and Saskatchewan, Quebec, Ontario, and British Columbia and 30 million Btu's in Alberta; and remaining units will use electricity for water-heating.[1]

The many trends affecting the highly competitive area of space and water-heating, and the impact of more apartment construction were considered. For example, in Ontario, space-heating in new dwelling units is going to natural gas first and electricity second. The projected trend towards more apartment dwellings and larger apartment complexes, coupled with conversion to more efficient fuels and energy, has the effect of decreasing average consumption per household which has not been reflected in these forecasts.

ANNUAL RATES OF CONSUMPTION PER DWELLING UNIT
(Millions of Btu's)

		1966 and 1990					
Province or Region	Dwelling Type	Natural Gas	Oil	Coal & Coke	Electri-city	Wood	Other (LPG)
Atlantic	Apart.	—	108	120	46	—	—
	Other	—	180	200	77	200	160
Québec	Apart.	84	99	117	44	—	—
	Other	140	165	195	73	195	160
Ontario	Apart.	81	93	111	42	—	—
	Other	135	155	185	70	185	160
Manitoba	Apart.	90	102	120	46	—	—
	Other	150	170	200	77	200	160
Saskatchewan	Apart.	93	105	123	—	—	—
	Other	155	175	205	—	205	160
Alberta	Apart.	108	120	138	—	—	—
	Other	180	200	230	—	230	160
British Columbia	Apart.	54	66	78	30	—	—
	Other	90	110	130	50	130	160
Yukon and N.W.T.	Apart.	—	126	—	—	—	—
	Other	—	210	240	—	240	—

[1] The use of oil-fired water heaters in these dwelling units was investigated, but not enough evidence has yet been assembled to make valid judgments as to its possible or probable impact.

ELECTRICITY DEMAND PER HOUSEHOLD
(KWH)

Province	1966	1990	Growth (Per cent)
Newfoundland	4,990	17,046	5.2
Prince Edward Island	4,840	17,593	5.5
Nova Scotia	7,000	20,758	4.6
New Brunswick	6,155	20,087	5.0
Québec	11,350	29,049	4.0
Ontario	12,281	31,164	4.0
Manitoba	13,371	33,852	4.0
Saskatchewan	7,792	22,000	4.4
Alberta	8,485	23,989	4.4
British Columbia	9,622	25,029	4.1
Yukon and N.W.T.	12,889	27,116	3.2
Canada	10,765	28,238	4.1

Automobile Transportation Energy Demand

Forecasts of fuel consumption by automobiles can be made by different approaches designed to arrive at probable future stocks of automobiles.[2]

A first approach used in this study is based on development of a saturation curve of the number of persons per automobile. This is obtained by using the experience of provinces with the lowest persons per car ratio and applying this experience to the others. This method suffers from the difficulty of determining the level and timing of ultimate saturation.

A second approach was adopted in this study to serve as a check on the results of the first approach. The second approach involves assumptions as to ownership saturations for the following three classes of automobiles:

(i) households with at least one automobile;

(ii) households with two or more automobiles; and,

(iii) cars other than privately owned.

Each of these classes is assigned the level and timing of ultimate saturation, by province. This method allows the postulation of the impact of higher density living in certain urban areas.

Using the second approach, the following assumptions were made:

(i) households with at least one automobile would gradually increase to about 80 per cent of all households;

(ii) households with at least two automobiles would increase rather more rapidly but would not exceed 40 per cent of all households; and,

(iii) non-privately-owned cars would continue to constitute a fixed percentage of all cars.

[2] Appendix C, Tables 12-15 inclusive give details on automobile stock, persons per automobile, private automobiles — first cars; private automobiles — second cars; by province, respectively.

For Canada as a whole the breakdown in percentage terms of car ownership is as follows:

Canada	1966	1990
First cars	67.5	55.8
Second cars	12.7	24.8
Non-private cars	19.8	19.4
	100.0	100.0

Electricity Energy Demand

A finalized breakdown for residential/commercial and industrial use of electricity is available only to 1963. Therefore, demand by sector was estimated for the base year 1966 and for the forecast period, as summarized below:

TOTAL ELECTRICITY DEMAND BY SECTOR[3]
(Thousands of GWH)

	Apparent	Estimated	
	1966	1975	1990
Residential/Commercial	56	102	248
Industrial	88	146	319
Losses and Unaccounted for	13	22	52
	157	270	619

[3] SOURCE: Appendix C, Table 19.

Apparent 1966 electricity demand by sector was estimated assuming that:

(i) the 1963 residential (including farm) use classification extrapolated to 1966 would be reasonably accurate; and,
(ii) the 1963 relationship between residential (including farm) use and commercial use would hold for 1966.

Residential and commercial use for 1966 was then calculated and deducted from total actual 1966 demand. The remainder was assumed to be apparent 1966 industrial use.

Over the forecast period, total electricity demand by province was projected based on a modified extrapolation of firm demand. Total provincial demands were then allocated to the residential/commercial and industrial sectors based on a declining rate of growth for the residential/commercial sector and a more constant rate of growth for the industrial sector (these rates of growth are shown in the tabulations below).

In allocating electricity demand by sector, recognition was given to

historical rates of growth. High historical rates reflect rural electrification and large scale installation of domestic and commercial appliances (air conditioning, communications, cleaning and drying equipment). Furthermore, there was a general upgrading in the type, size and method of operation of appliances.

RESIDENTIAL AND COMMERCIAL ELECTRICITY DEMAND
(Average Percentage Increase)

	1949-1966	1966-1975	1975-1980	1980-1985	1985-1990
Newfoundland	11.9	9.1	7.4	6.3	5.5
Prince Edward Island	11.5	7.9	6.3	6.0	5.5
Nova Scotia	10.2	7.1	5.2	5.0	5.0
New Brunswick	12.3	6.8	6.4	5.5	5.5
Québec	11.4	6.8	6.5	6.0	6.0
Ontario	9.0	7.0	6.1	6.0	6.0
Manitoba	6.5	5.3	5.3	5.2	4.9
Saskatchewan	13.1	5.8	5.1	5.1	5.0
Alberta	14.2	7.0	6.8	6.6	6.6
British Columbia	10.2	7.8	6.5	6.4	6.3
Yukon and N.W.T.	11.6	7.2	6.9	6.8	6.8
Canada	10.0	6.9	6.5	6.0	6.0

INDUSTRIAL ELECTRICITY DEMAND
(Average Percentage Increase)

	1949-1966	1966-1975	1975-1980	1980-1985	1985-1990
Newfoundland	5.3	10.4	6.0	6.0	6.0
Prince Edward Island	9.9	17.7	15.9	13.9	12.8
Nova Scota	4.8	6.7	5.8	5.8	5.8
New Brunswick	6.8	5.5	6.6	6.5	6.4
Québec	4.8	4.3	4.3	4.3	4.3
Ontario	5.9	5.4	5.3	5.0	5.0
Manitoba	6.2	6.1	6.1	6.1	6.1
Saskatchewan	6.3	16.4	9.4	8.3	6.4
Alberta	11.1	12.0	9.2	9.2	9.2
British Columbia	10.3	6.3	5.4	5.4	5.4
Yukon and N.W.T.	5.7	5.9	5.9	5.9	5.9
Canada	5.9	5.8	5.4	5.4	5.4

Electricity Supply

Electricity generation was split into (1) industrial and (2) utility portions, following the DBS classification. Some growth in industrial generation was allowed for in Saskatchewan, Alberta and British Columbia, but in other provinces it was assumed to be constant.

Estimates of annual load factors were made for each province based on

the sum of the industrial and the utility generation.[4] From these annual load factors the peak loads in each province were estimated. The utility generation was arrived at by deducting the estimated industrial generation (assuming generally an 80 per cent annual load factor) from the total estimated electricity generation.

Estimates of fuel consumption for utilities at various types of generating stations were prepared.[5] The fuel used includes the component which varies with the load on the unit and a fixed fuel component required for starts and stops, and spinning 'ready to serve' but not carrying load. In addition provision was made for units operating at lower efficiencies while on part load. As a result, these derived heat rates Btu's per KWH) are higher than the heat rates normally quoted for units which are measured at best efficiency. These heat rates were assumed to remain constant throughout the forecast period (see tabulation below).

In some large thermal stations light oil is used for starting units but is not used for power generation while the units are running. The consumption of light oil does not correlate with the energy generated at the station and has been estimated roughly by station, using figures on existing stations reported by DBS.

In some cases hydraulic and nuclear plants could supply the total energy requirements but some conventional thermal generation must be scheduled to meet daily peak loads. In such cases a minimum annual capacity factor of 5 per cent is assumed for thermal generation.

Diesel generation has generally been assumed to continue at a constant level. This allows for the continuation of service to small isolated localities not integrated into the main power systems.

Generation Type	Fuel Unit	KWH per Fuel Unit	Calorific Value	Btu's per KWH
Steam				
Bituminous coal.....	ton	2,700	13,000 Btu/lb.	9,600
Sub-bituminous coal....	ton	1,300	8,060 Btu/lb.	12,400
Lignite.....	ton	1,000	6,600 Btu/lb.	13,200
Heavy oil.....	barrel	546	182,000 Btu/gal.	11,700
Natural gas.....	Mcf	80	1,025 Btu/cf.	12,800
Uranium.....				11,700
Gas Turbine				
Light oil.....	barrel	322	166,000 Btu/gal.	18,000
Natural gas.....	Mcf	60	1,025 Btu/cf.	17,100
Diesel				
Diesel oil.....	barrel	490	165,000 Btu/gal.	11,800

The unit heat rates are quite low, but in each case they are based on modern stations. Units installed in the future may be slightly more efficient than present units but are not expected to lead to marked changes in fuel consumption.

[4] Using DBS Electric Power Statics, Volume I.
[5] Using DBS reports on 1966 Thermal Station Production and Fuel Costs.

Appendix C

INDEX OF TABLES

TABLE 1

POPULATION ESTIMATES

(in thousands)

	1966	1975	1980	1985	1990
Nfld.	493	564	607	654	705
P.E.I.	109	117	122	127	132
N.S.	756	791	811	831	852
N.B.	617	651	671	691	712
Que.	5,781	6,610	7,121	7,671	8,264
Ont.	6,961	8,393	9,312	10,331	11,463
Man.	963	1,044	1,092	1,142	1,194
Sask.	955	1,008	1,038	1,070	1,102
Alta.	1,463	1,733	1,904	2,092	2,298
B.C.	1,874	2,382	2,721	3,109	3,552
Y. & N.W.T.	43	56	65	75	87
Canada	20,015	23,349	25,464	27,793	30,361

SOURCE: 1966 DBS. Forecast: NEB Staff Estimate.

TABLE 2

PERSONS PER HOUSEHOLD

	1966	1975	1980	1985	1990
Nfld.	5.082	4.866	4.746	4.626	4.506
P.E.I.	4.360	4.252	4.192	4.132	4.072
N.S.	4.086	3.870	3.750	3.630	3.510
N.B.	4.345	4.075	3.925	3.775	3.625
Que.	4.164	3.892	3.742	3.592	3.442
Ont.	3.709	3.601	3.541	3.481	3.421
Man.	3.718	3.610	3.550	3.490	3.430
Sask.	3.673	3.583	3.533	3.483	3.433
Alta.	3.713	3.623	3.573	3.523	3.473
B.C.	3.451	3.433	3.423	3.413	3.403
Y. & N.W.T.	4.778	4.508	4.358	4.208	4.058
Canada	3.864	3.711	3.626	3.543	3.460

SOURCE: 1966 Derived from DBS Census. Forecast: NEB Staff Estimate.

TABLE 3

HOUSEHOLDS OR OCCUPIED DWELLINGS

(in thousands)

	1966	1975	1980	1985	1990
Nfld.	97.0	115.8	128.0	141.4	156.4
P.E.I.	25.0	27.5	29.1	30.7	32.4
N.S.	185.0	204.3	216.2	229.0	242.8
N.B.	142.0	159.8	170.9	183.1	196.5
Que.	1,389.0	1,698.3	1,902.9	2,135.6	2,400.9
Ont.	1,877.0	2,330.7	2,629.7	2,968.0	3,350.7
Man.	259.0	289.2	307.5	327.1	348.1
Sask.	260.0	281.3	293.9	307.2	321.1
Alta.	394.0	478.3	532.9	593.8	661.8
B.C.	543.0	693.8	795.0	910.9	1,043.8
Y. & N.W.T.	9.0	12.4	14.9	17.9	21.5
Canada	5,180.0	6,291.4	7,021.0	7,844.7	8,776.0

SOURCE: 1966 DBS Census. Forecast: NEB Staff Estimate.

TABLE 4

NUMBER OF APARTMENTS

(in thousands)

	1966	1975	1980	1985	1990
Nfld.	9.0	14.7	18.3	22.3	26.8
P.E.I.	3.0	3.8	4.2	4.7	5.2
N.S.	31.0	36.8	40.3	44.2	48.3
N.B.	29.0	34.3	37.7	41.3	45.3
Que.	719.0	904.6	1,027.4	1,167.0	1,326.2
Ont.	453.0	679.9	829.5	998.6	1,190.0
Man.	48.0	60.1	67.4	75.3	83.6
Sask.	34.0	41.4	45.9	50.5	55.4
Alta.	75.0	112.9	137.5	164.9	195.5
B.C.	114.0	189.4	240.0	297.9	364.4
Y. & N.W.T.	1.0	2.0	2.8	3.7	4.8
Canada	1,516.0	2,079.9	2,451.0	2,870.4	3,345.5

SOURCE: 1966 DBS Census. Forecast: NEB Staff Estimate.

TABLE 5

NUMBER OF SINGLE, DOUBLE AND ROWHOUSING UNITS

(in thousands)

	1966	1975	1980	1985	1990
Nfld.	88.0	101.1	109.7	119.1	129.6
P.E.I.	22.0	23.7	24.9	26.0	27.2
N.S.	154.0	167.5	175.9	184.8	194.5
N.B.	113.0	125.5	133.2	141.8	151.2
Que.	670.0	793.7	875.5	968.6	1,074.7
Ont.	1,424.0	1,650.8	1,800.2	1,969.4	2,160.7
Man.	211.0	229.1	240.1	251.8	264.5
Sask.	226.0	239.9	248.0	256.7	265.7
Alta.	319.0	365.4	395.4	428.9	466.3
B.C.	429.0	504.4	555.0	613.0	679.4
Y. & N.W.T.	8.0	10.4	12.1	14.2	16.7
Canada	3,664.0	4,211.5	4,570.0	4,974.3	5,430.5

SOURCE: 1966 DBS Census. Forecast: NEB Staff Estimate.

TABLE 6

APARTMENT RATIO

(in percentages)

	1966	1975	1980	1985	1990
Nfld.	9.28	12.65	14.29	15.78	17.15
P.E.I.	12.00	13.66	14.52	15.38	16.11
N.S.	16.75	18.01	18.66	19.30	19.91
N.B.	20.42	21.48	22.04	22.57	23.08
Que.	51.76	53.26	53.99	54.64	55.24
Ont.	24.14	29.17	31.54	33.65	35.51
Man.	18.53	20.77	21.92	23.00	24.03
Sask.	13.08	14.73	15.61	16.44	17.25
Alta.	19.03	23.61	25.80	27.77	29.54
B.C.	20.99	27.30	30.19	32.71	34.91
Y. & N.W.T.	11.11	16.34	18.61	20.51	22.11
Canada	29.27	33.06	34.91	36.59	38.12

SOURCE: Tables 3, 4.

TABLE 7

RESIDENTIAL SPACE-HEATING ALLOCATION*, CANADA

(in thousands)

	1966	1975	1980	1985	1990
Apartments —					
Coal	165.6	82.5	48.8	21.0	—
Oil	1,022.2	1,100.0	1,137.4	1,173.9	1,209.1
Gas	299.0	724.4	997.3	1,301.2	1,641.2
Electric	29.2	173.0	267.5	374.3	495.2
Total	1,516.0	2,079.9	2,451.0	2,870.4	3,345.5
Other Dwellings —					
Coal	96.8	25.8	3.9	—	—
Oil	2,041.4	2,084.2	2,086.4	2,073.6	2,046.0
Gas	1,070.2	1,536.1	1,826.9	2,138.2	2,469.3
Electric	56.8	243.9	365.9	503.2	658.0
Wood	331.8	219.6	165.6	118.6	97.1
Other	67.0	101.9	121.3	140.7	160.1
Total	3,664.0	4,211.5	4,570.0	4,974.3	5,430.5
All Dwellings —					
Coal	262.4	108.3	52.7	21.0	—
Oil	3,063.6	3,184.2	3,223.8	3,247.5	3,255.1
Gas	1,369.2	2,260.5	2,824.2	3,439.4	4,110.5
Electric	86.0	416.9	633.4	877.5	1,153.2
Wood	331.8	219.6	165.6	118.6	97.1
Other	67.0	101.9	121.3	140.7	160.1
Total	5,180.0	6,291.4	7,021.0	7,844.7	8,776.0
Distribution — % —					
Coal	5.1	1.7	0.8	0.3	—
Oil	59.1	50.7	45.9	41.4	37.2
Gas	26.4	35.9	40.2	43.8	46.8
Electric	1.7	6.6	9.0	11.2	13.1
Wood	6.4	3.5	2.4	1.5	1.1
Other	1.3	1.6	1.7	1.8	1.8

*Provincial or Regional data may not add due to rounding.

SOURCE: NEB Staff Estimate.

TABLE 7

RESIDENTIAL SPACE-HEATING ALLOCATION, NEWFOUNDLAND

(in thousands)

	1966	1975	1980	1985	1990
Apartments —					
Coal	—	—	—	—	—
Oil	8.8	12.7	15.3	18.3	21.8
Gas	—	—	—	—	—
Electric	0.2	2.0	3.0	4.0	5.0
Total	9.0	14.7	18.3	22.3	26.8
Other Dwellings —					
Coal	14.0	—	—	—	—
Oil	53.0	91.9	99.2	107.4	116.6
Gas	—	—	—	—	—
Electric	0.5	2.3	3.3	4.3	5.3
Wood	20.0	6.0	6.0	6.0	6.0
Other	0.5	0.9	1.2	1.4	1.7
Total	88.0	101.1	109.7	119.1	129.6
All Dwellings —					
Coal	14.0	—	—	—	—
Oil	61.8	104.6	114.5	125.7	138.4
Gas	—	—	—	—	—
Electric	0.7	4.3	6.3	8.3	10.3
Wood	20.0	6.0	6.0	6.0	6.0
Other	0.5	0.9	1.2	1.4	1.7
Total	97.0	115.8	128.0	141.4	156.4
Distribution — % —					
Coal	14.4	—	—	—	—
Oil	63.8	90.3	89.5	88.9	88.5
Gas	—	—	—	—	—
Electric	0.7	3.7	4.9	5.9	6.6
Wood	20.6	5.2	4.7	4.2	3.8
Other	0.5	0.8	0.9	1.0	1.1

SOURCE: NEB Staff Estimate.

TABLE 7

RESIDENTIAL SPACE-HEATING ALLOCATION, MARITIME PROVINCES

(in thousands)

	1966	1975	1980	1985	1990
Apartments —					
Coal	7.0	2.5	0.8	—	—
Oil	56.0	67.4	73.7	79.8	85.6
Gas	—	—	—	—	—
Electric	—	5.0	7.7	10.4	13.2
Total	63.0	74.9	82.2	90.2	98.8
Other Dwellings —					
Coal	32.8	12.0	2.0	—	—
Oil	199.1	258.7	292.1	313.9	333.1
Gas	—	—	—	—	—
Electric	2.5	8.3	11.6	14.8	18.1
Wood	51.8	32.9	22.4	16.9	13.6
Other	2.8	4.8	5.9	7.0	8.1
Total	289.0	316.7	334.0	352.6	372.9
All Dwellings —					
Coal	39.8	14.5	2.8	—	—
Oil	255.1	326.1	365.8	393.7	418.7
Gas	—	—	—	—	—
Electric	2.5	13.3	19.3	25.2	31.3
Wood	51.8	32.9	22.4	16.9	13.6
Other	2.8	4.8	5.9	7.0	8.1
Total	352.0	391.6	416.2	442.8	471.7
Distribution — % —					
Coal	11.3	3.7	0.7	—	—
Oil	72.5	83.3	87.9	88.9	88.8
Gas	—	—	—	—	—
Electric	0.7	3.4	4.6	5.7	6.6
Wood	14.7	8.4	5.4	3.8	2.9
Other	0.8	1.2	1.4	1.6	1.7

SOURCE: NEB Staff Estimate.

TABLE 7

RESIDENTIAL SPACE-HEATING ALLOCATION, QUEBEC
(in thousands)

	1966	1975	1980	1985	1990
Apartments —					
Coal	11.0	2.0	—	—	—
Oil	618.9	710.5	767.8	830.6	902.3
Gas	76.0	131.7	168.5	210.4	258.1
Electric	14.0	60.4	91.1	126.0	165.8
Total	719.0	904.6	1,027.4	1,167.0	1,326.2
Other Dwellings —					
Coal	0.1	—	—	—	—
Oil	487.6	571.5	622.6	677.6	727.3
Gas	17.1	48.0	68.5	91.8	118.3
Electric	15.2	64.7	97.4	134.7	177.1
Wood	141.7	96.7	71.7	46.7	31.7
Other	8.3	12.8	15.3	17.8	20.3
Total	670.0	793.7	875.5	968.6	1,074.7
All Dwellings —					
Coal	11.1	2.0	—	—	—
Oil	1,105.6	1,282.0	1,390.4	1,508.2	1,629.6
Gas	93.1	179.7	237.0	302.2	376.4
Electric	29.2	125.1	188.5	260.7	342.9
Wood	141.7	96.7	71.7	46.7	31.7
Other	8.3	12.8	15.3	17.8	20.3
Total	1,389.0	1,698.3	1,902.9	2,135.6	2,400.9
Distribution — % —					
Coal	0.8	0.1	—	—	—
Oil	79.6	75.4	73.0	70.1	67.9
Gas	6.7	10.6	12.5	14.1	15.7
Electric	2.1	7.4	9.9	12.2	14.3
Wood	10.2	5.7	3.8	2.8	1.3
Other	0.6	0.8	0.8	0.8	0.8

SOURCE: NEB Staff Estimate.

TABLE 7

RESIDENTIAL SPACE-HEATING ALLOCATION, ONTARIO

(in thousands)

	1966	1975	1980	1985	1990
Apartments —					
Coal	116.0	71.0	46.0	21.0	—
Oil	234.0	222.2	210.0	192.6	165.8
Gas	95.0	310.6	452.6	613.3	795.1
Electric	8.0	76.1	120.9	171.7	229.1
Total	453.0	679.9	829.5	998.6	1,190.0
Other Dwellings —					
Coal	4.1	—	—	—	—
Oil	877.2	810.7	763.3	709.2	639.1
Gas	451.2	666.8	808.8	969.5	1,151.3
Electric	25.8	116.6	176.4	244.0	320.6
Wood	54.4	36.4	26.4	16.4	14.4
Other	11.3	20.3	25.3	30.3	35.3
Total	1,424.0	1,650.8	1,800.2	1,969.4	2,160.7
All Dwellings —					
Coal	120.1	71.0	46.0	21.0	—
Oil	1,111.2	1,032.9	973.3	901.8	804.9
Gas	546.2	977.4	1,261.4	1,582.8	1,946.4
Electric	33.8	192.7	297.3	415.7	549.7
Wood	54.4	36.4	26.4	16.4	14.4
Other	11.3	20.3	25.3	30.3	35.3
Total	1,877.0	2,330.7	2,629.7	2,968.0	3,350.7
Distribution — % —					
Coal	6.4	3.0	1.7	0.7	—
Oil	59.2	44.3	37.0	30.4	24.0
Gas	29.1	41.9	48.0	53.3	58.1
Electric	1.8	8.3	11.3	14.0	16.4
Wood	2.9	1.6	1.0	0.6	0.4
Other	0.6	0.9	1.0	1.0	1.1

SOURCE: NEB Staff Estimate.

TABLE 7

RESIDENTIAL SPACE-HEATING ALLOCATION, MANITOBA

(in thousands)

	1966	1975	1980	1985	1990
Apartments —					
Coal	8.0	—	—	—	—
Oil	11.0	6.5	4.0	1.5	—
Gas	29.0	53.6	63.4	73.8	83.6
Electric	—	—	—	—	—
Total	48.0	60.1	67.4	75.3	83.6
Other Dwellings —					
Coal	11.0	2.9	—	—	—
Oil	90.0	63.0	48.0	33.0	30.0
Gas	89.9	135.0	158.9	178.6	186.8
Electric	4.1	13.1	18.1	23.1	28.1
Wood	11.7	7.2	4.7	4.2	4.2
Other	3.4	7.9	10.4	12.9	15.4
Total	211.0	229.1	240.1	251.8	264.5
All Dwellings —					
Coal	19.9	2.9	—	—	—
Oil	101.0	69.5	52.0	34.5	30.0
Gas	118.9	188.6	222.3	252.4	270.4
Electric	4.1	13.1	18.1	23.1	28.1
Wood	11.7	7.2	4.7	4.2	4.2
Other	3.4	7.9	10.4	12.9	15.4
Total	259.0	289.2	307.5	327.1	348.1
Distribution — % —					
Coal	7.7	1.0	—	—	—
Oil	39.0	24.0	16.9	10.5	8.6
Gas	45.9	65.3	72.3	77.2	77.7
Electric	1.6	4.5	5.9	7.1	8.1
Wood	4.5	2.5	1.5	1.3	1.2
Other	1.3	2.7	3.4	3.9	4.4

SOURCE: NEB Staff Estimate.

TABLE 7

RESIDENTIAL SPACE-HEATING ALLOCATION, SASKATCHEWAN

(in thousands)

	1966	1975	1980	1985	1990
Apartments —					
Coal	—	—	—	—	—
Oil	11.0	7.4	5.4	3.4	1.4
Gas	23.0	34.0	40.5	47.1	54.0
Electric	—	—	—	—	—
Total	34.0	41.4	45.9	50.5	55.4
Other Dwellings —					
Coal	15.9	6.9	1.9	—	—
Oil	87.5	65.0	52.5	40.0	30.0
Gas	108.1	150.8	174.9	196.5	213.2
Electric	—	—	—	—	—
Wood	8.3	6.5	5.5	4.5	4.3
Other	6.2	10.7	13.2	15.7	18.2
Total	226.0	239.9	248.0	256.7	265.7
All Dwellings —					
Coal	15.9	6.9	1.9	—	—
Oil	98.5	72.4	57.9	43.4	31.4
Gas	131.1	184.8	215.4	243.6	267.2
Electric	—	—	—	—	—
Wood	8.3	6.5	5.5	4.5	4.3
Other	6.2	10.7	13.2	15.7	18.2
Total	260.0	281.3	293.9	307.2	321.1
Distribution — % —					
Coal	6.1	2.5	0.6	—	—
Oil	37.9	25.7	19.7	14.1	9.8
Gas	50.4	65.7	73.3	79.3	83.2
Electric	—	—	—	—	—
Wood	3.2	2.3	1.9	1.5	1.3
Other	2.4	3.8	4.5	5.1	5.7

SOURCE: NEB Staff Estimate.

TABLE 7

RESIDENTIAL SPACE-HEATING ALLOCATION, ALBERTA

(in thousands)

	1966	1975	1980	1985	1990
Apartments —					
Coal	16.0	7.0	2.0	—	—
Oil	5.0	5.0	5.0	5.0	5.0
Gas	54.0	100.9	130.5	159.9	190.5
Electric	—	—	—	—	—
Total	75.0	112.9	137.5	164.9	195.5
Other Dwellings —					
Coal	17.5	4.0	—	—	—
Oil	24.2	20.6	20.0	20.0	20.0
Gas	249.4	309.4	341.5	372.5	407.4
Electric	—	—	—	—	—
Wood	7.1	6.1	6.1	6.1	6.1
Other	20.8	25.3	27.8	30.3	32.8
Total	319.0	365.4	395.4	428.9	466.3
All Dwellings —					
Coal	33.5	11.0	2.0	—	—
Oil	29.2	25.6	25.0	25.0	25.0
Gas	303.4	410.3	472.0	532.4	597.9
Electric	—	—	—	—	—
Wood	7.1	6.1	6.1	6.1	6.1
Other	20.8	25.3	27.8	30.3	32.8
Total	394.0	478.3	532.9	593.8	661.8
Distribution — % —					
Coal	8.5	2.3	0.4	—	—
Oil	7.4	5.4	4.7	4.2	3.8
Gas	77.0	85.7	88.6	89.7	90.3
Electric	—	—	—	—	—
Wood	1.8	1.3	1.1	1.0	0.9
Other	5.3	5.3	5.2	5.1	5.0

SOURCE: NEB Staff Estimate.

TABLE 7

RESIDENTIAL SPACE-HEATING ALLOCATION, BRITISH COLUMBIA

(in thousands)

	1966	1975	1980	1985	1990
Apartments —					
Coal	7.6	—	—	—	—
Oil	77.4	66.2	53.5	39.0	22.5
Gas	22.0	93.6	141.7	196.7	259.8
Electric	7.0	29.6	44.8	62.2	82.1
Total	114.0	189.4	240.0	297.9	364.4
Other Dwellings —					
Coal	—	—	—	—	—
Oil	218.5	195.7	180.0	161.8	136.6
Gas	154.5	226.1	274.2	329.2	392.3
Electric	8.7	38.9	59.1	82.3	108.8
Wood	33.7	24.7	19.7	14.7	13.7
Other	13.6	19.0	22.0	25.0	28.0
Total	429.0	504.4	555.0	613.0	679.4
All Dwellings —					
Coal	7.6	—	—	—	—
Oil	295.9	261.9	233.5	200.8	159.1
Gas	176.5	319.7	415.9	525.9	652.1
Electric	15.7	68.5	103.9	144.5	190.9
Wood	33.7	24.7	19.7	14.7	13.7
Other	13.6	19.0	22.0	25.0	28.0
Total	543.0	693.8	795.0	910.9	1,043.8
Distribution — % —					
Coal	1.4	—	—	—	—
Oil	54.5	37.7	29.3	22.1	15.2
Gas	32.5	46.1	52.3	57.7	62.5
Electric	2.9	9.9	13.1	15.9	18.3
Wood	6.2	3.6	2.5	1.6	1.3
Other	2.5	2.7	2.8	2.7	2.7

SOURCE: NEB Staff Estimate.

TABLE 7

RESIDENTIAL SPACE-HEATING ALLOCATION, YUKON AND N.W.T.

(in thousands)

	1966	1975	1980	1985	1990
Apartments —					
Coal	—	—	—	—	—
Oil	1.0	2.0	2.8	3.7	4.8
Gas	—	—	—	—	—
Electric	—	—	—	—	—
Total	1.0	2.0	2.8	3.7	4.8
Other Dwellings —					
Coal	0.5	—	—	—	—
Oil	4.3	7.1	8.8	10.8	13.3
Gas	—	—	—	—	—
Electric	—	—	—	—	—
Wood	3.1	3.1	3.1	3.1	3.1
Other	0.1	0.2	0.2	0.3	0.3
Total	8.0	10.4	12.1	14.2	16.7
All Dwellings —					
Coal	0.5	—	—	—	—
Oil	5.3	9.1	11.6	14.5	18.1
Gas	—	—	—	—	—
Electric	—	—	—	—	—
Wood	3.1	3.1	3.1	3.1	3.1
Other	0.1	0.2	0.2	0.3	0.3
Total	9.0	12.4	14.9	17.9	21.5
Distribution — % —					
Coal	5.6	—	—	—	—
Oil	59.1	73.7	77.8	81.0	84.1
Gas	—	—	—	—	—
Electric	—	—	—	—	—
Wood	34.2	24.7	20.6	17.3	14.3
Other	1.1	1.6	1.6	1.7	1.6

SOURCE: NEB Staff Estimate.

TABLE 8

RESIDENTIAL AND COMMERCIAL FUEL DEMAND, CANADA

(in Btu 10^{12})

	1966	1975	1980	1985	1990
Residential					
Coal	37.2	14.7	6.3	2.3	—
Oil	440.1	460.4	467.6	472.5	475.4
Gas	211.2	329.5	403.5	483.4	569.6
Electric	4.9	23.8	35.8	49.6	65.0
Wood	62.8	41.4	31.3	22.4	18.4
Other	10.6	16.1	19.2	22.3	25.6
Total	766.8	885.9	963.7	1,052.5	1,154.0
Commercial					
Coal	36.0	12.7	5.5	2.3	—
Oil	304.1	373.4	416.3	461.8	522.0
Gas	99.8	200.1	264.6	340.9	422.8
Total	439.9	586.2	686.4	805.0	944.8
Residential & Commercial					
Coal	73.2	27.4	11.8	4.6	—
Oil	744.2	833.8	883.9	934.3	997.4
Gas	311.0	529.6	668.1	824.3	992.4
Electric	4.9	23.8	35.8	49.6	65.0
Wood	62.8	41.4	31.3	22.4	18.4
Other	10.6	16.1	19.2	22.3	25.6
Total	1,206.7	1,472.1	1,650.1	1,857.5	2,098.8
Commercial Demand Ratio—%	36.5	39.8	41.6	43.3	45.0

SOURCE: NEB Staff Estimate.

TABLE 8

RESIDENTIAL AND COMMERCIAL FUEL DEMAND, NEWFOUNDLAND

(in Btu 10^{12})

	1966	1975	1980	1985	1990
Residential					
Coal	1.4	—	—	—	—
Oil	10.7	18.2	19.8	21.7	23.8
Gas	—	—	—	—	—
Electric	—	0.3	0.4	0.5	0.6
Wood	4.0	1.2	1.2	1.2	1.2
Other	0.1	0.1	0.2	0.2	0.3
Total	16.2	19.8	21.6	23.6	25.9
Commercial					
Coal	—	—	—	—	—
Oil	9.8	12.8	14.8	17.2	20.0
Gas	—	—	—	—	—
Total	9.8	12.8	14.8	17.2	20.0
Residential & Commercial					
Coal	1.4	—	—	—	—
Oil	20.5	31.0	34.6	38.9	43.8
Gas	—	—	—	—	—
Electric	—	0.3	0.4	0.5	0.6
Wood	4.0	1.2	1.2	1.2	1.2
Other	0.1	0.1	0.2	0.2	0.3
Total	26.0	32.6	36.4	40.8	45.9
Commercial Demand Ratio—%	37.7	39.3	40.7	42.2	43.6

SOURCE: NEB Staff Estimate.

TABLE 8

RESIDENTIAL AND COMMERCIAL FUEL DEMAND, MARITIME PROVINCES

(in Btu 10^{12})

	1966	1975	1980	1985	1990
Residential					
Coal	7.4	2.7	0.5	—	—
Oil	43.0	55.2	62.0	66.7	70.9
Gas	—	—	—	—	—
Electric	0.2	0.9	1.2	1.6	2.0
Wood	10.4	6.6	4.5	3.4	2.7
Other	0.4	0.8	0.9	1.1	1.3
Total	61.4	66.2	69.1	72.8	76.9
Commercial					
Coal	4.7	1.7	0.3	—	—
Oil	30.5	41.1	47.5	53.6	60.0
Gas	0.1	0.1	0.1	—	—
Total	35.3	42.9	47.9	53.6	60.0
Residential & Commercial					
Coal	12.1	4.4	0.8	—	—
Oil	73.5	96.3	109.5	120.3	130.9
Gas	0.1	0.1	0.1	—	—
Electric	0.2	0.9	1.2	1.6	2.0
Wood	10.4	6.6	4.5	3.4	2.7
Other	0.4	0.8	0.9	1.1	1.3
Total	96.7	109.1	117.0	126.4	136.9
Commercial Demand Ratio—%	36.5	39.3	40.9	42.4	43.8

SOURCE: NEB Staff Estimate.

TABLE 8

RESIDENTIAL AND COMMERCIAL FUEL DEMAND, QUEBEC

(in Btu 10^{12})

	1966	1975	1980	1985	1990
Residential					
Coal	1.3	0.2	—	—	—
Oil	154.0	178.9	194.1	210.7	227.4
Gas	10.7	21.6	28.8	37.0	46.4
Electric	1.7	7.4	11.1	15.4	20.2
Wood	27.6	18.9	14.0	9.1	6.2
Other	1.3	2.0	2.4	2.8	3.2
Total	196.6	229.0	250.4	275.0	303.4
Commercial					
Coal	6.0	1.1	—	—	—
Oil	113.1	151.8	174.9	200.0	229.7
Gas	2.4	9.6	16.5	25.8	37.1
Total	121.5	162.5	191.4	225.8	266.8
Residential & Commercial					
Coal	7.3	1.3	—	—	—
Oil	267.1	330.7	369.0	410.7	457.1
Gas	13.1	31.2	45.3	62.8	83.5
Electric	1.7	7.4	11.1	15.4	20.2
Wood	27.6	18.9	14.0	9.1	6.2
Other	1.3	2.0	2.4	2.8	3.2
Total	318.1	391.5	441.8	500.8	570.2
Commercial Demand Ratio—%	38.2	41.5	43.3	45.1	46.8

SOURCE: NEB Staff Estimate.

TABLE 8

RESIDENTIAL AND COMMERCIAL FUEL DEMAND, ONTARIO

(in Btu 10^{12})

	1966	1975	1980	1985	1990
Residential					
Coal	13.6	7.9	5.1	2.3	—
Oil	162.4	150.8	142.0	131.7	117.8
Gas	81.8	138.1	175.1	217.1	264.5
Electric	2.1	11.4	17.4	24.3	32.1
Wood	10.1	6.7	4.9	3.0	2.7
Other	1.8	3.2	4.0	4.8	5.6
Total	271.8	318.1	348.5	383.2	422.7
Commercial					
Coal	13.2	7.6	4.9	2.3	—
Oil	100.6	113.3	121.9	130.5	148.3
Gas	42.2	94.7	128.9	170.6	211.6
Total	156.0	215.6	255.7	303.4	359.9
Residential & Commercial					
Coal	26.8	15.5	10.0	4.6	—
Oil	263.0	264.1	263.9	262.2	266.1
Gas	124.0	232.8	304.0	387.7	476.1
Electric	2.1	11.4	17.4	24.3	32.1
Wood	10.1	6.7	4.9	3.0	2.7
Other	1.8	3.2	4.0	4.8	5.6
Total	427.8	533.7	604.2	686.6	782.6
Commercial Demand Ratio—%	36.5	40.4	42.3	44.2	46.0

SOURCE: NEB Staff Estimate.

TABLE 8

RESIDENTIAL AND COMMERCIAL FUEL DEMAND, MANITOBA

(in Btu 10^{12})

	1966	1975	1980	1985	1990
Residential					
Coal	3.3	0.6	—	—	—
Oil	16.4	11.4	8.6	5.8	5.1
Gas	18.5	28.8	34.0	38.5	41.0
Electric	0.3	1.0	1.4	1.8	2.2
Wood	2.3	1.4	0.9	0.8	0.8
Other	0.5	1.3	1.7	2.1	2.5
Total	41.3	44.5	46.6	49.0	51.6
Commercial					
Coal	2.5	0.4	—	—	—
Oil	9.5	10.0	10.3	10.6	10.9
Gas	8.3	14.4	17.4	20.4	23.8
Total	20.3	24.8	27.7	31.0	34.7
Residential & Commercial					
Coal	5.8	1.0	—	—	—
Oil	25.9	21.4	18.9	16.4	16.0
Gas	26.8	43.2	51.4	58.9	64.8
Electric	0.3	1.0	1.4	1.8	2.2
Wood	2.3	1.4	0.9	0.8	0.8
Other	0.5	1.3	1.7	2.1	2.5
Total	61.6	69.3	74.3	80.0	86.3
Commercial Demand Ratio—%	33.0	35.8	37.3	38.8	40.2

SOURCE: NEB Staff Estimate.

TABLE 8

RESIDENTIAL AND COMMERCIAL FUEL DEMAND, SASKATCHEWAN

(in Btu 10^{12})

	1966	1975	1980	1985	1990
Residential					
Coal	3.3	1.4	0.4	—	—
Oil	16.4	12.2	9.8	7.4	5.4
Gas	21.5	30.2	35.2	39.7	43.4
Electric	—	—	—	—	—
Wood	1.7	1.3	1.1	0.9	0.9
Other	1.0	1.7	2.1	2.5	2.9
Total	43.9	46.8	48.6	50.5	52.6
Commercial					
Coal	—	—	—	—	—
Oil	12.3	12.8	13.1	13.5	13.8
Gas	9.0	12.4	14.5	16.9	19.6
Total	21.3	25.2	27.6	30.4	33.4
Residential & Commercial					
Coal	3.3	1.4	0.4	—	—
Oil	28.7	25.0	22.9	20.9	19.2
Gas	30.5	42.6	49.7	56.6	63.0
Electric	—	—	—	—	—
Wood	1.7	1.3	1.1	0.9	0.9
Other	1.0	1.7	2.1	2.5	2.9
Total	65.2	72.0	76.2	80.9	86.0
Commercial Demand Ratio—%	32.7	35.0	36.2	37.6	38.8

SOURCE: NEB Staff Estimate.

TABLE 8

RESIDENTIAL AND COMMERCIAL FUEL DEMAND, ALBERTA

(in Btu 10^{12})

	1966	1975	1980	1985	1990
Residential					
Coal	6.2	1.9	0.3	—	—
Oil	5.4	4.7	4.6	4.6	4.6
Gas	59.3	77.9	88.4	98.7	110.0
Electric	—	—	—	—	—
Wood	1.6	1.4	1.4	1.4	1.4
Other	3.3	4.0	4.4	4.8	5.2
Total	75.8	89.9	99.1	109.5	121.2
Commercial					
Coal	6.9	1.9	0.3	—	—
Oil	11.8	16.0	19.0	22.6	26.8
Gas	28.0	44.0	53.2	62.3	72.6
Total	46.7	61.9	72.5	84.9	99.4
Residential & Commercial					
Coal	13.1	3.8	0.6	—	—
Oil	17.2	20.7	23.6	27.2	31.4
Gas	87.3	121.9	141.6	161.0	182.6
Electric	—	—	—	—	—
Wood	1.6	1.4	1.4	1.4	1.4
Other	3.3	4.0	4.4	4.8	5.2
Total	122.5	151.8	171.6	194.4	220.6
Commercial Demand Ratio—%	38.1	40.8	42.2	43.7	45.1

SOURCE: NEB Staff Estimate.

TABLE 8

RESIDENTIAL AND COMMERCIAL FUEL DEMAND, BRITISH COLUMBIA

(in Btu 10^{12})

	1966	1975	1980	1985	1990
Residential					
Coal	0.6	—	—	—	—
Oil	30.7	27.2	24.4	21.1	16.9
Gas	19.4	32.9	42.0	52.4	64.3
Electric	0.6	2.8	4.3	6.0	7.9
Wood	4.4	3.2	2.6	1.9	1.8
Other	2.2	3.0	3.5	4.0	4.5
Total	57.9	69.1	76.8	85.4	95.4
Commercial					
Coal	2.7	—	—	—	—
Oil	14.7	13.0	11.7	10.1	8.1
Gas	9.8	24.9	34.0	44.9	58.1
Total	27.2	37.9	45.7	55.0	66.2
Residential & Commercial					
Coal	3.3	—	—	—	—
Oil	45.4	40.2	36.1	31.2	25.0
Gas	29.2	57.8	76.0	97.3	122.4
Electric	0.6	2.8	4.3	6.0	7.9
Wood	4.4	3.2	2.6	1.9	1.8
Other	2.2	3.0	3.5	4.0	4.5
Total	85.1	107.0	122.5	140.4	161.6
Commercial Demand Ratio—%	32.0	35.4	37.3	39.2	41.0

SOURCE: NEB Staff Estimate.

TABLE 8

RESIDENTIAL AND COMMERCIAL FUEL DEMAND, YUKON AND N.W.T.

(in Btu 10^{12})

	1966	1975	1980	1985	1990
Residential					
Coal	0.1	—	—	—	—
Oil	1.1	1.8	2.3	2.8	3.5
Gas	—	—	—	—	—
Electric	—	—	—	—	—
Wood	0.7	0.7	0.7	0.7	0.7
Other	—	—	—	—	0.1
Total	1.9	2.5	3.0	3.5	4.3
Commercial					
Coal	—	—	—	—	—
Oil	1.8	2.6	3.1	3.7	4.4
Gas	—	—	—	—	—
Total	1.8	2.6	3.1	3.7	4.4
Residential & Commercial					
Coal	0.1	—	—	—	—
Oil	2.9	4.4	5.4	6.5	7.9
Gas	—	—	—	—	—
Electric	—	—	—	—	—
Wood	0.7	0.7	0.7	0.7	0.7
Other	—	—	—	—	0.1
Total	3.7	5.1	6.1	7.2	8.7
Commercial Demand Ratio—%	48.6	51.0	50.8	51.4	50.6

SOURCE: NEB Staff Estimate.

TABLE 9

RESIDENTIAL AND COMMERCIAL FUEL CONSUMPTION, CANADA

	1966	1975	1980	1985	1990
COAL — (M Tons)	2,800	1,038	451	176	—
OIL — (MBbls.)					
Kerosene	16,941	15,870	15,340	14,850	14,360
Diesel	7,531	9,860	11,540	13,480	15,790
Light	72,193	80,400	84,540	88,130	92,920
Heavy	29,131	34,580	37,630	40,990	44,880
Total	125,796	140,710	149,050	157,450	167,950
OIL — (Btu 10^{12})					
Kerosene	96.2	90.2	87.2	84.3	81.6
Diesel	44.0	57.5	67.3	78.6	92.0
Light	420.7	468.5	492.6	513.5	541.5
Heavy	183.3	217.6	236.8	257.9	282.3
Total	744.2	833.8	883.9	934.3	997.4
GAS — (Bcf)	311.0	529.6	668.1	824.3	992.4
ELECTRICITY* (GWH)	1,487	6,945	10,506	14,514	19,032

*Residential space-heating only.
SOURCE: NEB Staff Estimate.

TABLE 9

RESIDENTIAL AND COMMERCIAL FUEL CONSUMPTION, NEWFOUNDLAND

	1966	1975	1980	1985	1990
COAL — (M Tons)	55	—	—	—	—
OIL — (MBbls.)					
Kerosene	1,127	1,060	1,020	990	950
Diesel	254	330	360	390	430
Light	1,469	3,000	3,400	3,880	4,410
Heavy	630	890	1,100	1,330	1,620
Total	3,480	5,280	5,880	6,590	7,410
OIL — (Btu 10^{12})					
Kerosene	6.4	6.0	5.8	5.6	5.4
Diesel	1.5	1.9	2.1	2.3	2.5
Light	8.6	17.5	19.8	22.6	25.7
Heavy	4.0	5.6	6.9	8.4	10.2
Total	20.5	31.0	34.6	38.9	43.8
GAS — (Bcf)	—	—	—	—	—
ELECTRICITY* (GWH)	14	79	115	151	187

*Residential space-heating only.
SOURCE: NEB Staff Estimate.

TABLE 9

RESIDENTIAL AND COMMERCIAL FUEL CONSUMPTION, MARITIME PROVINCES

	1966	1975	1980	1985	1990
COAL — (M Tons)	460	168	31	—	—
OIL — (MBbls.)					
Kerosene	2,674	2,410	2,290	2,170	2,040
Diesel	679	890	1,030	1,180	1,370
Light	6,692	9,520	10,950	11,790	12,320
Heavy	2,447	3,480	4,240	5,150	6,280
Total	12,492	16,300	18,510	20,290	22,010
OIL — (Btu 10^{12})					
Kerosene	15.1	13.7	13.0	12.3	11.6
Diesel	4.0	5.2	6.0	6.9	8.0
Light	39.0	55.5	63.8	68.7	71.8
Heavy	15.4	21.9	26.7	32.4	39.5
Total	73.5	96.3	109.5	120.3	130.9
GAS — (Bcf)	0.1	0.1	0.1	—	—
ELECTRICITY* (GWH)	57	249	356	464	570

*Residential space-heating only.
SOURCE: NEB Staff Estimate.

TABLE 9

RESIDENTIAL AND COMMERCIAL FUEL CONSUMPTION, QUEBEC

	1966	1975	1980	1985	1990
COAL — (M Tons)	280	42	—	—	—
OIL — (MBbls.)					
Kerosene	5,835	5,830	5,830	5,830	5,830
Diesel	842	1,200	1,460	1,770	2,160
Light	25,146	30,580	34,100	38,030	42,400
Heavy	13,123	17,860	20,450	23,150	26,110
Total	44,946	55,470	61,840	68,780	76,500
OIL — (Btu 10^{12})					
Kerosene	33.1	33.1	33.1	33.1	33.1
Diesel	4.9	7.0	8.5	10.3	12.6
Light	146.5	178.2	198.7	221.6	247.1
Heavy	82.6	112.4	128.7	145.7	164.3
Total	267.1	330.7	369.0	410.7	457.1
GAS — (Bcf)	13.1	31.2	45.3	62.8	83.5
ELECTRICITY* (GWH)	506	2,163	3,259	4,506	5,927

*Residential space-heating only.
SOURCE: NEB Staff Estimate.

TABLE 9

RESIDENTIAL AND COMMERCIAL FUEL CONSUMPTION, ONTARIO

	1966	1975	1980	1985	1990
COAL — (M Tons)	1,024	592	382	176	—
OIL — (MBbls.)					
Kerosene	3,222	2,940	2,800	2,660	2,540
Diesel	1,275	1,820	2,210	2,690	3,260
Light	29,681	29,690	29,670	29,290	29,770
Heavy	10,201	10,140	9,880	9,650	9,410
Total	44,379	44,590	44,560	44,290	44,980
OIL — (Btu 10^{12})					
Kerosene	18.3	16.7	15.9	15.1	14.4
Diesel	7.5	10.6	12.9	15.7	19.0
Light	173.0	173.0	172.9	170.7	173.5
Heavy	64.2	63.8	62.2	60.7	59.2
Total	263.0	264.1	263.9	262.2	266.1
GAS — (Bcf)	124.0	232.8	304.0	387.7	476.1
ELECTRICITY*					
(GWH)	628	3,328	5,070	7,120	9,397

*Residential space-heating only.
SOURCE: NEB Staff Estimate.

TABLE 9

RESIDENTIAL AND COMMERCIAL FUEL CONSUMPTION, MANITOBA

	1966	1975	1980	1985	1990
COAL — (M Tons)	224	38	—	—	—
OIL — (MBbls.)					
Kerosene	963	790	700	620	530
Diesel	896	1,060	1,180	1,300	1,440
Light	2,031	1,390	1,000	600	550
Heavy	536	410	350	290	220
Total	4,426	3,650	3,230	2,810	2,740
OIL — (Btu 10^{12})					
Kerosene	5.5	4.5	4.0	3.5	3.0
Diesel	5.2	6.2	6.9	7.6	8.4
Light	11.8	8.1	5.8	3.5	3.2
Heavy	3.4	2.6	2.2	1.8	1.4
Total	25.9	21.4	18.9	16.4	16.0
GAS — (Bcf)	26.8	43.2	51.4	58.9	64.8
ELECTRICITY*					
(GWH)	93	296	409	521	634

*Residential space-heating only.
SOURCE: NEB Staff Estimate.

TABLE 9

RESIDENTIAL AND COMMERCIAL FUEL CONSUMPTION, SASKATCHEWAN

	1966	1975	1980	1985	1990
COAL — (M Tons)	127	53	15	—	—
OIL — (MBbls.)					
Kerosene	1,370	1,090	950	810	670
Diesel	1,714	1,870	1,970	2,080	2,180
Light	1,562	1,120	820	550	330
Heavy	294	220	190	160	130
Total	4,940	4,300	3,930	3,600	3,310
OIL — (Btu 10^{12})					
Kerosene	7.8	6.2	5.4	4.6	3.8
Diesel	10.0	10.9	11.5	12.1	12.7
Light	9.1	6.5	4.8	3.2	1.9
Heavy	1.8	1.4	1.2	1.0	0.8
Total	28.7	25.0	22.9	20.9	19.2
GAS — (Bcf)	30.5	42.6	49.7	56.6	63.0
ELECTRICITY* (GWH)	—	—	—	—	—

*Residential space-heating only.
SOURCE: NEB Staff Estimate.

TABLE 9

RESIDENTIAL AND COMMERCIAL FUEL CONSUMPTION, ALBERTA

	1966	1975	1980	1985	1990
COAL — (M Tons)	500	145	23	—	—
OIL — (MBbls.)					
Kerosene	362	360	360	360	360
Diesel	1,272	1,870	2,370	2,990	3,710
Light	905	910	910	910	910
Heavy	390	390	390	390	390
Total	2,929	3,530	4,030	4,650	5,370
OIL — (Btu 10^{12})					
Kerosene	2.1	2.1	2.1	2.1	2.1
Diesel	7.4	10.9	13.8	17.4	21.6
Light	5.3	5.3	5.3	5.3	5.3
Heavy	2.4	2.4	2.4	2.4	2.4
Total	17.2	20.7	23.6	27.2	31.4
GAS — (Bcf)	87.3	121.9	141.6	161.0	182.6
ELECTRICITY* (GWH)	—	—	—	—	—

*Residential space-heating only.
SOURCE: NEB Staff Estimate.

TABLE 9

RESIDENTIAL AND COMMERCIAL FUEL CONSUMPTION, BRITISH COLUMBIA

	1966	1975	1980	1985	1990
COAL — (M Tons)	125	—	—	—	—
OIL — (MBbls.)					
Kerosene	1,250	1,180	1,140	1,110	1,070
Diesel	480	650	740	820	910
Light	4,463	3,810	3,230	2,510	1,560
Heavy	1,506	1,190	1,030	870	720
Total	7,699	6,830	6,140	5,310	4,260
OIL — (Btu 10^{12})					
Kerosene	7.1	6.7	6.5	6.3	6.1
Diesel	2.8	3.8	4.3	4.8	5.3
Light	26.0	22.2	18.8	14.6	9.1
Heavy	9.5	7.5	6.5	5.5	4.5
Total	45.4	40.2	36.1	31.2	25.0
GAS — (Bcf)	29.2	57.8	76.0	97.3	122.4
ELECTRICITY*					
(GWH)	189	830	1,260	1,752	2,317

*Residential space-heating only.
SOURCE: NEB Staff Estimate.

TABLE 9

RESIDENTIAL AND COMMERCIAL FUEL CONSUMPTION, YUKON AND N.W.T.

	1966	1975	1980	1985	1990
COAL — (M Tons)	5	—	—	—	—
OIL — (MBbls.)					
Kerosene	138	210	250	300	370
Diesel	119	170	220	260	330
Light	244	380	460	570	670
Heavy	4	—	—	—	—
Total	505	760	930	1,130	1,370
OIL — (Btu 10^{12})					
Kerosene	0.8	1.2	1.4	1.7	2.1
Diesel	0.7	1.0	1.3	1.5	1.9
Light	1.4	2.2	2.7	3.3	3.9
Heavy	—	—	—	—	—
Total	2.9	4.4	5.4	6.5	7.9
GAS — (Bcf)	—	—	—	—	—
ELECTRICITY*					
(GWH)	—	—	—	—	—

*Residential space-heating only.
SOURCE: NEB Staff Estimate.

TABLE 10

INDUSTRIAL FUEL CONSUMPTION, CANADA

	1966	1975	1980	1985	1990
COAL—(M Tons)	13,973	13,175	13,605	14,195	14,855
OIL—(MBbls.)					
Kerosene	1,753	2,000	2,160	2,290	2,430
Diesel	9,238	13,060	15,940	19,690	24,640
Light	6,586	7,420	7,940	8,510	9,070
Heavy	37,062	56,540	69,730	85,770	105,130
Total	54,639	79,020	95,770	116,260	141,270
OIL—(Btu 10^{12})					
Kerosene	9.9	11.3	12.1	12.9	13.7
Diesel	53.9	76.1	92.9	114.7	143.6
Light	38.2	43.3	46.3	49.6	52.9
Heavy	233.3	355.8	438.8	539.7	661.5
Total	335.3	486.5	590.1	716.9	871.7
GAS—(Bcf)	260.2	555.9	728.2	937.3	1,198.2
ELECTRICITY* (GWH)	1,578	—	—	—	—
		(in Btu 10^{12})			
COAL	358.0	337.3	348.6	363.8	380.7
OIL	335.3	486.5	590.1	716.9	871.7
GAS	260.2	555.9	728.2	937.3	1,198.2
ELECTRICITY*	5.4	—	—	—	—
Total	958.9	1,379.7	1,666.9	2,018.0	2,450.6

*Boiler Electricity Only.
SOURCE: NEB Staff Estimate.

TABLE 10

INDUSTRIAL FUEL CONSUMPTION, NEWFOUNDLAND

	1966	1975	1980	1985	1990
COAL—(M Tons)	—	—	—	—	—
OIL—(MBbls.)					
Kerosene	57	70	90	110	120
Diesel	509	790	1,010	1,290	1,650
Light	110	150	190	240	270
Heavy	1,590	2,860	3,940	5,420	7,470
Total	2,266	3,870	5,230	7,060	9,510
OIL—(Btu 10^{12})					
Kerosene	0.3	0.4	0.5	0.6	0.7
Diesel	3.0	4.6	5.9	7.5	9.6
Light	0.6	0.9	1.1	1.4	1.6
Heavy	10.0	18.0	24.8	34.1	47.0
Total	13.9	23.9	32.3	43.6	58.9
GAS—(Bcf)	—	—	—	—	—
ELECTRICITY* (GWH)	—	—	—	—	—
		(in Btu 10^{12})			
COAL	—	—	—	—	—
OIL	13.9	23.9	32.3	43.6	58.9
GAS	—	—	—	—	—
ELECTRICITY*	—	—	—	—	—
Total	13.9	23.9	32.3	43.6	58.9

*Boiler Electricity Only.
SOURCE: NEB Staff Estimate.

TABLE 10

INDUSTRIAL FUEL CONSUMPTION, MARITIME PROVINCES

	1966	1975	1980	1985	1990
COAL—(M Tons)	1,297	880	880	880	880
OIL—(MBbls.)					
Kerosene	69	120	160	190	230
Diesel	279	410	480	550	620
Light	249	360	410	460	510
Heavy	2,082	8,450	9,100	9,760	10,410
Total	2,679	9,340	10,150	10,960	11,770
OIL—(Btu 10^{12})					
Kerosene	0.4	0.7	0.9	1.1	1.3
Diesel	1.6	2.4	2.8	3.2	3.6
Light	1.5	2.1	2.4	2.7	3.0
Heavy	13.1	53.2	57.3	61.4	65.5
Total	16.6	58.4	63.4	68.4	73.4
GAS—(Bcf)	—	—	—	—	—
ELECTRICITY* (GWH)	98	—	—	—	—
		(in Btu 10^{12})			
COAL	34.0	23.1	23.1	23.1	23.1
OIL	16.6	58.4	63.4	68.4	73.4
GAS	—	—	—	—	—
ELECTRICITY*	0.3	—	—	—	—
Total	50.9	81.5	86.5	91.5	96.5

*Boiler Electricity Only.
SOURCE: NEB Staff Estimate.

TABLE 10

INDUSTRIAL FUEL CONSUMPTION, QUEBEC

	1966	1975	1980	1985	1990
COAL—(M Tons)	2,055	1,590	1,340	1,090	840
OIL—(MBbls.)					
Kerosene	456	560	620	670	720
Diesel	1,641	2,330	2,850	3,450	4,200
Light	2,444	2,920	3,230	3,570	3,930
Heavy	16,354	20,130	24,250	28,170	31,450
Total	20,895	25,940	30,950	35,860	40,300
OIL—(Btu 10^{12})					
Kerosene	2.6	3.2	3.5	3.8	4.1
Diesel	9.6	13.6	16.6	20.1	24.5
Light	14.2	17.0	18.8	20.8	22.9
Heavy	102.9	126.7	152.6	177.3	197.9
Total	129.3	160.5	191.5	220.0	249.4
GAS—(Bcf)	19.4	67.2	85.6	111.2	148.0
ELECTRICITY* (GWH)	1,163	—	—	—	—
		(in Btu 10^{12})			
COAL	53.6	41.5	35.0	28.5	22.0
OIL	129.3	160.5	191.5	222.0	249.4
GAS	19.4	67.2	85.6	111.2	148.0
ELECTRICITY*	4.0	—	—	—	—
Total	206.3	269.2	312.1	361.7	419.4

*Boiler Electricity Only.
SOURCE: NEB Staff Estimate.

TABLE 10

INDUSTRIAL FUEL CONSUMPTION, ONTARIO

	1966	1975	1980	1985	1990
COAL—(M Tons).....	9,673	9,620	10,200	10,900	11,620
OIL—(MBbls.)					
Kerosene.....	479	480	480	480	480
Diesel.....	1,817	2,590	3,140	3,830	4,650
Light.....	2,771	2,760	2,760	2,760	2,760
Heavy.....	10,960	15,560	20,610	27,790	37,820
Total.....	16,027	21,390	26,990	34,860	45,710
OIL—(Btu 10^{12})					
Kerosene.....	2.7	2.7	2.7	2.7	2.7
Diesel.....	10.6	15.1	18.3	22.3	27.1
Light.....	16.1	16.1	16.1	16.1	16.1
Heavy.....	69.0	97.9	129.7	174.9	238.0
Total.....	98.4	131.8	166.8	216.0	283.9
GAS—(Bcf).....	115.8	247.9	312.5	380.7	454.0
ELECTRICITY*					
(GWH).....	144	—	—	—	—
		(in Btu 10^{12})			
COAL.....	251.5	250.2	265.2	283.3	302.2
OIL.....	98.4	131.8	166.8	216.0	283.9
GAS.....	115.8	247.9	312.5	380.7	454.0
ELECTRICITY*.....	0.5	—	—	—	—
Total.....	466.2	629.9	744.5	880.0	1,040.1

*Boiler Electricity Only.
SOURCE: NEB Staff Estimate.

TABLE 10

INDUSTRIAL FUEL CONSUMPTION, MANITOBA

	1966	1975	1980	1985	1990
COAL—(M Tons).....	366	290	250	220	200
OIL—(MBbls.)					
Kerosene.....	86	90	90	90	90
Diesel.....	272	330	360	390	430
Light.....	105	140	150	170	190
Heavy.....	444	890	920	970	920
Total.....	907	1,450	1,520	1,620	1,630
OIL—(Btu 10^{12})					
Kerosene.....	0.5	0.5	0.5	0.5	0.5
Diesel.....	1.6	1.9	2.1	2.3	2.5
Light.....	0.6	0.8	0.9	1.0	1.1
Heavy.....	2.8	5.6	5.8	6.1	5.8
Total.....	5.5	8.8	9.3	9.9	9.9
GAS—(Bcf).....	10.6	20.8	27.5	35.3	45.2
ELECTRICITY*					
(GWH).....	118	—	—	—	—
		(in Btu 10^{12})			
COAL.....	6.0	4.8	4.2	3.7	3.3
OIL.....	5.5	8.8	9.3	9.9	9.9
GAS.....	10.6	20.8	27.5	35.3	45.2
ELECTRICITY.....	0.4	—	—	—	—
Total.....	22.5	34.4	41.0	48.9	58.4

*Boiler Electricity Only.
SOURCE: NEB Staff Estimate.

TABLE 10

INDUSTRIAL FUEL CONSUMPTION, SASKATCHEWAN

	1966	1975	1980	1985	1990
COAL—(M Tons)	64	65	65	65	65
OIL—(MBbls.)					
Kerosene	95	90	90	90	90
Diesel	597	1,030	1,270	1,510	1,750
Light	141	170	190	210	220
Heavy	17	20	20	20	20
Total	850	1,310	1,570	1,830	2,080
OIL—(Btu 10^{12})					
Kerosene	0.5	0.5	0.5	0.5	0.5
Diesel	3.5	6.0	7.4	8.8	10.2
Light	0.8	1.0	1.1	1.2	1.3
Heavy	0.1	0.1	0.1	0.1	0.1
Total	4.9	7.6	9.1	10.6	12.1
GAS—(Bcf)	21.7	46.0	59.5	73.0	86.5
ELECTRICITY* (GWH)	—	—	—	—	—
		(in Btu 10^{12})			
COAL	1.0	1.0	1.0	1.0	1.0
OIL	4.9	7.6	9.1	10.6	12.1
GAS	21.7	46.0	59.5	73.0	86.5
ELECTRICITY*	—	—	—	—	—
Total	27.6	54.6	69.6	84.6	99.6

*Boiler Electricity Only.
SOURCE: NEB Staff Estimate.

TABLE 10

INDUSTRIAL FUEL CONSUMPTION, ALBERTA

	1966	1975	1980	1985	1990
COAL—(M Tons).....	160	210	240	280	320
OIL—(MBbls.)					
Kerosene.....	97	110	110	110	110
Diesel.....	1,402	1,770	2,010	2,280	2,570
Light.....	246	270	290	310	330
Heavy.....	289	290	290	290	290
Total.....	2,034	2,440	2,700	2,990	3,300
OIL—(Btu 10^{12})					
Kerosene.....	0.6	0.6	0.6	0.6	0.6
Diesel.....	8.2	10.3	11.7	13.3	15.0
Light.....	1.4	1.6	1.7	1.8	1.9
Heavy.....	1.8	1.8	1.8	1.8	1.8
Total.....	12.0	14.3	15.8	17.5	19.3
GAS—(Bcf).....	67.4	115.3	154.1	205.3	272.6
ELECTRICITY*					
(GWH).....	—	—	—	—	—
		(in Btu 10^{12})			
COAL.....	3.1	4.0	4.7	5.4	6.3
OIL.....	12.0	14.3	15.8	17.5	19.3
GAS.....	67.4	115.3	154.1	205.3	272.6
ELECTRICITY*.....	—	—	—	—	—
Total.....	82.5	133.6	174.6	228.2	298.2

*Boiler Electricity Only.
SOURCE: NEB Staff Estimate.

TABLE 10

INDUSTRIAL FUEL CONSUMPTION, BRITISH COLUMBIA

	1966	1975	1980	1985	1990
COAL—(M Tons).....	358	520	630	760	930
OIL—(MBbls.)					
Kerosene.....	341	340	340	340	340
Diesel.....	2,494	2,990	3,290	3,640	4,020
Light.....	390	460	500	530	570
Heavy.....	5,221	8,170	10,390	13,110	16,480
Total.....	8,446	11,960	14,520	17,620	21,410
OIL—(Btu 10^{12})					
Kerosene.....	1.9	1.9	1.9	1.9	1.9
Diesel.....	14.5	17.4	19.2	21.2	23.4
Light.....	2.3	2.7	2.9	3.1	3.3
Heavy.....	32.9	51.4	65.4	82.5	103.7
Total.....	51.6	73.4	89.4	108.7	132.3
GAS—(Bcf).....	25.3	58.7	89.0	131.8	191.9
ELECTRICITY*					
(GWH).....	3	—	—	—	—
		(in Btu 10^{12})			
COAL.....	8.8	12.7	15.4	18.8	22.8
OIL.....	51.6	73.4	89.4	108.7	132.3
GAS.....	25.3	58.7	89.0	131.8	191.9
ELECTRICITY*.....	—	—	—	—	—
Total.....	85.7	144.8	193.8	259.3	347.0

*Boiler Electricity Only.
SOURCE: NEB Staff Estimate.

TABLE 10

INDUSTRIAL FUEL CONSUMPTION, YUKON & N.W.T.

	1966	1975	1980	1985	1990
COAL—(M Tons)	—	—	—	—	—
OIL—(MBbls.)					
Kerosene	73	140	180	210	250
Diesel	227	820	1,530	2,750	4,750
Light	130	190	220	260	290
Heavy	105	170	210	240	270
Total	535	1,320	2,140	3,460	5,560
OIL—(Btu 10^{12})					
Kerosene	0.4	0.8	1.0	1.2	1.4
Diesel	1.3	4.8	8.9	16.0	27.7
Light	0.7	1.1	1.3	1.5	1.7
Heavy	0.7	1.1	1.3	1.5	1.7
Total	3.1	7.8	12.5	20.2	32.5
GAS—(Bcf)	—	—	—	—	—
ELECTRICITY* (GWH)	52	—	—	—	—
		(in Btu 10^{12})			
COAL	—	—	—	—	—
OIL	3.1	7.8	12.5	20.2	32.5
GAS	—	—	—	—	—
ELECTRICITY*	0.2	—	—	—	—
Total	3.3	7.8	12.5	20.2	32.5

*Boiler Electricity Only.
SOURCE: NEB Staff Estimate.

TABLE 11

TRANSPORTATION FUEL CONSUMPTION, CANADA
(in MBbls.)

	1966	1975	1980	1985	1990
Automobile	99,085	146,620	173,510	200,130	227,700
Motor Gasoline	99,085	146,620	173,510	200,130	227,700
Commercial	41,881	62,410	78,220	98,500	123,340
Motor Gasoline	37,057	55,490	69,780	88,120	110,850
Diesel Fuel	4,824	6,920	8,440	10,380	12,490
Rail	11,307	15,590	18,660	22,380	26,860
Diesel Fuel	11,307	15,590	18,660	22,380	26,860
Marine	16,309	21,670	25,390	29,790	35,010
Diesel Fuel	5,009	7,980	10,250	13,150	16,840
Heavy Fuel	11,300	13,690	15,140	16,640	18,170
Aviation	11,840	25,780	39,720	60,830	91,840
Aviation Gasoline	1,773	1,440	1,290	1,190	1,170
Turbo Fuel	10,067	24,340	38,430	59,640	90,670
Total Oil	180,422	272,070	335,500	411,630	504,750
Total Coal (M Tons)	556	180	80	—	—
		(in Btu 10^{12})			
Motor Gasoline	710.9	1,055.5	1,270.3	1,504.7	1,767.9
Diesel Fuel	122.5	177.1	216.4	266.4	326.4
Heavy Fuel	71.2	86.2	95.2	104.7	114.3
Aviation Gasoline	9.0	7.5	6.7	6.1	6.0
Turbo Fuel	54.4	131.9	208.1	323.6	491.8
Total	968.0	1,458.2	1,796.7	2,205.5	2,706.4
Coal	13.5	4.7	2.1	—	—
Total Transport	981.5	1,462.9	1,798.8	2,205.5	2,706.4

SOURCE: DBS Refined Petroleum Products, Vol. II, NEB Staff Estimate.

TABLE 11

TRANSPORTATION FUEL DEMAND, NEWFOUNDLAND
(in MBbls.)

	1966	1975	1980	1985	1990
Automobile	1,411	2,450	3,180	4,000	4,900
Motor Gasoline	1,411	2,450	3,180	4,000	4,900
Commercial	392	620	790	1,010	1,290
Motor Gasoline	381	590	750	960	1,230
Diesel Fuel	11	30	40	50	60
Rail	255	300	340	370	410
Diesel Fuel	255	300	340	370	410
Marine	1,044	1,320	1,480	1,670	1,890
Diesel Fuel	889	1,130	1,270	1,440	1,640
Heavy Fuel	155	190	210	230	250
Aviation	547	1,010	1,390	1,880	2,510
Aviation Gasoline	97	70	50	40	40
Turbo Fuel	450	940	1,340	1,840	2,470
Total Oil	3,649	5,700	7,180	8,930	11,000
Total Coal (M Tons)	1	—	—	—	—
		(in Btu 10^{12})			
Motor Gasoline	9.4	15.9	20.5	25.9	32.0
Diesel Fuel	6.1	7.7	8.7	9.8	11.2
Heavy Fuel	1.0	1.2	1.3	1.4	1.6
Aviation Gasoline	0.5	0.4	0.3	0.2	0.2
Turbo Fuel	2.4	5.1	7.3	10.0	13.4
Total Oil	19.4	30.3	38.1	47.3	58.4
Coal	—	—	—	—	—
Total Transport	19.4	30.3	38.1	47.3	58.4

SOURCE: DBS Refined Petroleum Products, Vol. II. NEB Staff Estimate.

TABLE 11

TRANSPORTATION FUEL DEMAND, MARITIME PROVINCES
(in MBbls.)

	1966	1975	1980	1985	1990
Automobile	6,739	9,660	11,080	12,130	12,970
Motor Gasoline	6,739	9,660	11,080	12,130	12,970
Commercial	1,810	2,190	2,430	2,690	2,970
Motor Gasoline	1,751	2,090	2,310	2,550	2,810
Diesel Fuel	59	100	120	140	160
Rail	796	1,040	1,200	1,400	1,620
Diesel Fuel	796	1,040	1,200	1,400	1,620
Marine	3,982	5,100	5,860	6,730	7,730
Diesel Fuel	1,378	1,960	2,390	2,900	3,530
Heavy Fuel	2,604	3,140	3,470	3,830	4,200
Aviation	957	1,730	2,370	3,190	4,230
Aviation Gasoline	269	190	150	120	100
Turbo Fuel	688	1,540	2,220	3,070	4,130
Total Oil	14,284	19,720	22,940	26,140	29,520
Total Coal (M Tons)	18	—	—	—	—
		(in Btu 10^{12})			
Motor Gasoline	44.3	61.4	69.9	76.7	82.4
Diesel Fuel	13.0	18.2	21.6	25.9	30.9
Heavy Fuel	16.4	19.8	21.8	24.1	26.4
Aviation Gasoline	1.4	1.0	0.8	0.6	0.5
Turbo Fuel	3.7	8.3	12.0	16.6	22.4
Total	78.8	108.7	126.1	143.9	162.6
Coal	0.5	—	—	—	—
Total Transport	79.3	108.7	126.1	143.9	162.6

SOURCE: DBS Refined Petroleum Products, Vol. II. NEB Staff Estimate.

TABLE 11

TRANSPORTATION FUEL DEMAND, QUEBEC
(in MBbls.)

	1966	1975	1980	1985	1990
Automobile	25,786	41,450	51,520	60,520	69,010
Motor Gasoline	25,786	41,450	51,520	60,520	69,010
Commercial	7,596	12,490	16,510	21,950	28,890
Motor Gasoline	6,342	10,710	14,340	19,190	25,680
Diesel Fuel	1,254	1,780	2,170	2,760	3,210
Rail	2,507	3,330	3,900	4,560	5,340
Diesel Fuel	2,507	3,330	3,900	4,560	5,340
Marine	6,340	8,340	9,720	11,320	13,190
Diesel Fuel	1,235	2,090	2,790	3,740	5,000
Heavy Fuel	5,105	6,250	6,930	7,580	8,190
Aviation	3,214	7,520	12,000	18,970	29,590
Aviation Gasoline	192	160	140	130	120
Turbo Fuel	3,022	7,360	11,860	18,840	29,470
Total Oil	45,443	73,130	93,650	117,320	146,020
Total Coal (M Tons)	40	—	—	—	—
		(in Btu 10^{12})			
Motor Gasoline	167.8	272.4	343.9	416.2	494.5
Diesel Fuel	29.1	42.0	51.6	64.4	79.0
Heavy Fuel	32.1	39.3	43.6	47.7	51.5
Aviation Gasoline	1.0	0.8	0.7	0.7	0.6
Turbo Fuel	16.4	39.9	64.2	102.0	159.6
Total	246.4	394.4	504.0	631.0	785.2
Coal	1.0	—	—	—	—
Total Transport	247.4	394.4	504.0	631.0	785.2

SOURCE: DBS Refined Petroleum Products, Vol. II. NEB Staff Estimate.

TABLE 11

TRANSPORTATION FUEL CONSUMPTION, ONTARIO
(in MBbls.)

	1966	1975	1980	1985	1990
Automobile.....	38,118	53,640	61,830	71,060	81,500
Motor Gasoline....	38,118	53,640	61,830	71,060	81,500
Commercial.....	13,359	21,310	27,650	35,890	46,620
Motor Gasoline....	11,925	19,300	25,230	32,980	43,110
Diesel Fuel.....	1,434	2,010	2,420	2,910	3,510
Rail.....	2,958	3,960	4,660	5,480	6,450
Diesel Fuel.....	2,958	3,960	4,660	5,480	6,450
Marine.....	2,510	3,450	4,120	4,910	5,870
Diesel Fuel.....	242	740	1,130	1,610	2,220
Heavy Fuel.....	2,268	2,710	2,990	3,300	3,650
Aviation.....	3,071	7,360	11,960	19,270	30,330
Aviation Gasoline..	263	220	200	180	160
Turbo Fuel.....	2,808	7,140	11,760	19,090	30,170
Total Oil.....	60,016	89,720	110,220	136,610	170,770
Total Coal (M Tons)...	360	180	80	—	—
		(in Btu 10^{12})			
Motor Gasoline.....	261.3	380.9	454.6	543.3	650.7
Diesel Fuel.....	27.0	39.1	47.8	58.3	71.0
Heavy Fuel.....	14.3	17.1	18.8	20.8	23.0
Aviation Gasoline.....	1.3	1.1	1.0	0.9	0.8
Turbo Fuel.....	15.2	38.7	63.7	103.4	163.4
Total.....	319.1	476.9	585.9	726.7	908.9
Coal.....	9.4	4.7	2.1	—	—
Total Transport....	328.5	481.6	588.0	726.7	908.9

SOURCE: DBS Refined Petroleum Products, Vol. II. NEB Staff Estimate.

TABLE 11

TRANSPORTATION FUEL CONSUMPTION, MANITOBA
(in MBbls.)

	1966	1975	1980	1985	1990
Automobile	4,476	6,140	6,840	7,440	7,970
Motor Gasoline	4,476	6,140	6,840	7,440	7,970
Commercial	2,741	3,620	4,220	4,930	5,400
Motor Gasoline	2,400	3,130	3,630	4,210	4,530
Diesel Fuel	341	490	590	720	870
Rail	846	1,140	1,350	1,600	1,890
Diesel Fuel	846	1,140	1,350	1,600	1,890
Marine	3	—	—	—	—
Diesel Fuel	—	—	—	—	—
Heavy Fuel	3	—	—	—	—
Aviation	1,068	1,910	2,590	3,410	4,390
Aviation Gasoline	180	150	140	120	110
Turbo Fuel	888	1,760	2,450	3,290	4,280
Total Oil	9,134	12,810	15,000	17,380	19,650
Total Coal (M Tons)	117	—	—	—	—
		(in Btu 10^{12})			
Motor Gasoline	35.9	48.4	54.7	60.3	65.3
Diesel Fuel	6.9	9.5	11.3	13.5	16.1
Heavy Fuel	..	—	—	—	—
Aviation Gasoline	0.9	0.8	0.7	0.6	0.6
Turbo Fuel	4.8	9.5	13.3	18.5	23.8
Total	48.5	68.2	80.0	92.9	105.8
Coal	2.1	—	—	—	—
Total Transport	50.6	68.2	80.0	92.9	105.8

..Less than 0.05 Btu 10^{12}.
SOURCE: DBS Refined Petroleum Products, Vol. II. NEB Staff Estimate.

TABLE 11

TRANSPORTATION FUEL CONSUMPTION, SASKATCHEWAN
(in MBbls.)

	1966	1975	1980	1985	1990
Automobile	4,848	6,390	6,980	7,460	7,870
Motor Gasoline	4,848	6,390	6,980	7,460	7,870
Commercial	5,005	6,640	7,730	8,990	10,060
Motor Gasoline	4,694	6,130	7,100	8,230	9,130
Diesel Fuel	361	510	630	760	930
Rail	1,032	1,460	1,760	2,140	2,590
Diesel Fuel	1,032	1,460	1,760	2,140	2,590
Marine	—	—	—	—	—
Diesel Fuel	—	—	—	—	—
Heavy Fuel	—	—	—	—	—
Aviation	345	560	700	850	1,010
Aviation Gasoline	52	50	50	40	40
Turbo Fuel	293	510	650	810	970
Total Oil	11,280	15,050	17,170	19,440	21,530
Total Coal (M Tons)	14	—	—	—	—
		(in Btu 10^{12})			
Motor Gasoline	49.8	65.4	73.5	81.9	88.8
Diesel Fuel	8.1	11.5	13.9	16.9	20.5
Heavy Fuel	—	—	—	—	—
Aviation Gasoline	0.3	0.3	0.3	0.2	0.2
Turbo Fuel	1.6	2.8	3.5	4.4	5.3
Total	59.8	80.0	91.2	103.4	114.8
Coal	0.4	—	—	—	—
Total Transport	60.2	80.0	91.2	103.4	114.8

SOURCE: DBS Refined Petroleum Products, Vol. II. NEB Staff Estimate.

TABLE 11

TRANSPORTATION FUEL CONSUMPTION, ALBERTA
(in MBbls.)

	1966	1975	1980	1985	1990
Automobile	7,596	10,800	12,500	14,170	16,150
Motor Gasoline	7,596	10,800	12,500	14,170	16,150
Commercial	6,757	8,890	10,350	12,060	13,900
Motor Gasoline	6,167	8,050	9,330	10,820	12,390
Diesel Fuel	590	840	1,020	1,240	1,510
Rail	1,841	2,710	3,360	4,170	5,180
Diesel Fuel	1,841	2,710	3,360	4,170	5,180
Marine	—	—	—	—	—
Diesel Fuel	—	—	—	—	—
Heavy Fuel	—	—	—	—	—
Aviation	1,170	2,360	3,470	5,070	7,270
Aviation Gasoline	204	170	150	140	130
Turbo Fuel	966	2,190	3,320	4,930	7,140
Total Oil	17,364	24,760	29,680	35,470	42,500
Total Coal (M Tons)	2	—	—	—	—
		(in Btu 10^{12})			
Motor Gasoline	71.9	98.4	114.0	130.5	149.0
Diesel Fuel	14.2	20.7	25.4	31.5	39.0
Heavy Fuel	—	—	—	—	—
Aviation Gasoline	1.0	0.9	0.8	0.7	0.7
Turbo Fuel	5.2	11.9	18.0	26.7	38.7
Total	92.3	131.9	158.2	189.4	227.4
Coal	..	—	—	—	—
Total Transport	92.3	131.9	158.2	189.4	227.4

..Less than 0.05 Btu 10^{12}.
SOURCE: DBS Refined Petroleum Products, Vol. II. NEB Staff Estimate.

TABLE 11

TRANSPORTATION FUEL CONSUMPTION, BRITISH COLUMBIA
(in MBbls.)

	1966	1975	1980	1985	1990
Automobile	10,029	15,870	19,270	22,930	26,790
Motor Gasoline	10,029	15,870	19,270	22,930	26,790
Commercial	4,074	6,270	7,970	10,130	12,880
Motor Gasoline	3,320	5,150	6,570	8,390	10,710
Diesel Fuel	754	1,120	1,400	1,740	2,170
Rail	1,072	1,650	2,090	2,660	3,380
Diesel Fuel	1,072	1,650	2,090	2,660	3,380
Marine	2,322	3,250	3,910	4,720	5,680
Diesel Fuel	1,154	1,850	2,370	3,020	3,800
Heavy Fuel	1,168	1,400	1,540	1,700	1,880
Aviation	1,336	2,900	4,470	6,840	10,290
Aviation Gasoline	408	260	200	150	120
Turbo Fuel	928	2,640	4,270	6,690	10,170
Total Oil	18,833	29,940	37,710	47,280	59,020
Total Coal (M Tons)	4	—	—	—	—
		(in Btu 10^{12})			
Motor Gasoline	69.7	109.8	134.9	163.6	195.8
Diesel Fuel	17.4	26.9	34.1	43.2	54.5
Heavy Fuel	7.4	8.8	9.7	10.7	11.8
Aviation Gasoline	2.1	1.3	1.0	0.8	0.6
Turbo Fuel	5.0	14.3	23.1	36.2	55.1
Total	101.6	161.1	202.8	254.5	317.8
Coal	0.1	—	—	—	—
Total Transport	101.7	161.1	202.8	254.5	317.8

SOURCE: DBS Refined Petroleum Products, Vol. II. NEB Staff Estimate.

TABLE 11

TRANSPORTATION FUEL CONSUMPTION, YUKON & N.W.T.
(in MBbls.)

	1966	1975	1980	1985	1990
Automobile	82	220	310	420	540
Motor Gasoline	82	220	310	420	540
Commercial	97	380	570	850	1,330
Motor Gasoline	77	340	520	790	1,260
Diesel Fuel	20	40	50	60	70
Rail	—	—	—	—	—
Diesel Fuel	—	—	—	—	—
Marine	103	210	300	440	650
Diesel Fuel	103	210	300	440	650
Heavy Fuel	—	—	—	—	—
Aviation	132	430	770	1,350	2,220
Aviation Gasoline	108	170	210	270	350
Turbo Fuel	24	260	560	1,080	1,870
Total Oil	414	1,240	1,950	3,060	4,740
Total Coal (M Tons)	—	—	—	—	—
		(in Btu 10^{12})			
Motor Gasoline	0.8	2.9	4.3	6.3	9.4
Diesel Fuel	0.7	1.5	2.0	2.9	4.2
Heavy Fuel	—	—	—	—	—
Aviation Gasoline	0.5	0.9	1.1	1.4	1.8
Turbo Fuel	0.1	1.4	3.0	5.8	10.1
Total	2.1	6.7	10.4	16.4	25.5
Coal	—	—	—	—	—
Total Transport	2.1	6.7	10.4	16.4	25.5

SOURCE: DBS Refined Petroleum Products, Vol. II. NEB Staff Estimate.

TABLE 12

AUTOMOBILE STOCK
(in thousands)

	1966	1975	1980	1985	1990
Newfoundland	72	125	162	204	250
Maritime Provinces	346	495	568	622	665
Quebec	1,186	1,910	2,374	2,789	3,180
Ontario	2,235	3,144	3,624	4,165	4,777
Manitoba	270	370	412	448	480
Saskatchewan	273	360	393	420	443
Alberta	445	633	732	830	946
British Columbia	665	927	1,088	1,279	1,505
Yukon & N.W.T.	6	13	18	24	31
Canada	5,498	7,977	9,371	10,781	12,277

SOURCE: DBS The Motor Vehicle, Part III. NEB Staff Estimate.

TABLE 13

PERSONS PER AUTOMOBILE

	1966	1975	1980	1985	1990
Newfoundland	6.85	4.50	3.75	3.20	2.82
Maritime Provinces	4.28	3.15	2.82	2.65	2.55
Quebec	4.87	3.46	3.00	2.75	2.60
Ontario	3.11	2.67	2.57	2.48	2.40
Manitoba	3.57	2.82	2.65	2.55	2.49
Saskatchewan	3.50	2.80	2.64	2.55	2.49
Alberta	3.29	2.74	2.60	2.52	2.43
British Columbia	2.82	2.57	2.50	2.43	2.36
Yukon & N.W.T.	6.72	4.40	3.70	3.15	2.80
Canada	3.64	2.93	2.72	2.58	2.47

SOURCE: TABLES 1 and 12.

TABLE 14

PRIVATE AUTOMOBILES — FIRST CARS
(in thousands)

	1966	1975	1980	1985	1990
Newfoundland	49	79	100	118	138
Maritime Provinces	247	310	333	354	377
Quebec	848	1,274	1,427	1,602	1,802
Ontario	1,458	1,807	2,038	2,300	2,597
Manitoba	191	231	246	262	278
Saskatchewan	199	239	250	261	273
Alberta	298	383	426	475	530
British Columbia	417	555	636	729	834
Yukon & N.W.T.	4	7	10	12	16
Canada	3,711	4,885	5,466	6,113	6,845
% of Stock	67.5	61.2	58.3	56.7	55.8

SOURCE: DBS Household Facilities and Equipment. NEB Staff Estimate.

TABLE 15

PRIVATE AUTOMOBILE — SECOND CARS
(in thousands)

	1966	1975	1980	1985	1990
Newfoundland	6	16	24	38	53
Maritime Provinces	32	86	121	144	155
Quebec	86	247	472	629	742
Ontario	315	708	861	1,032	1,225
Manitoba	37	81	102	116	127
Saskatchewan	33	67	84	96	104
Alberta	66	135	173	204	244
British Columbia	123	198	247	310	388
Yukon & N.W.T.	1	3	5	7	9
Canada	699	1,541	2,089	2,576	3,047
% of Stock	12.7	19.3	22.3	23.9	24.8

SOURCE: DBS Household Facilities and Equipment. NEB Staff Estimate.

TABLE 16

PETROLEUM PRODUCT DEMAND, CANADA
(in MBbls.)

	1966	1975	1980	1985	1990
Motor Gasoline.....	136,142	202,110	243,290	288,250	338,550
Middle Distillate.....	136,519	160,830	176,860	195,410	218,700
Kerosene & stove oil..	18,694	17,870	17,500	17,140	16,790
Resid. & Comm..	16,941	15,870	15,340	14,850	14,360
Industrial.....	1,753	2,000	2,160	2,290	2,430
Diesel fuel.....	38,847	54,560	66,250	80,770	99,060
Resid. & Comm..	7,531	9,860	11,540	13,480	15,790
Industrial.....	9,238	13,060	15,940	19,690	24,640
Electric Ut'l.....	939	1,130	1,440	1,690	2,440
Transport.....	21,139	30,510	37,330	45,910	56,190
Light fuel.....	78,978	88,400	93,110	97,500	102,850
Resid. & Comm..	72,193	80,400	84,540	88,130	92,920
Industrial.....	6,586	7,420	7,940	8,510	9,070
Electric Ut'l.....	199	580	630	860	860
Heavy Fuel.....	82,338	111,570	139,960	165,510	195,710
Resid. & Comm..	29,131	34,580	37,630	40,990	44,880
Industrial.....	37,062	56,540	69,730	85,770	105,130
Electric Ut'l.....	4,845	6,760	17,460	22,110	27,530
Transport.....	11,300	13,690	15,140	16,640	18,170
Other Products.....	55,347	96,790	133,180	183,130	254,470
Aviation gasoline.....	1,773	1,440	1,290	1,190	1,170
Turbo fuel.....	10,067	24,340	38,430	59,640	90,600
Non-fuel products....	33,462	54,590	73,610	98,890	135,730
LPG.....	10,045	16,420	19,850	23,410	26,970
Total Product Demand	410,346	571,300	693,290	832,300	1,007,430

SOURCE: DBS Refined Petroleum Products, Vols. I & II.
DBS Crude Petroleum and Natural Gas Products.
DBS Electric Power Statistics, Vol. II.

TABLE 16

PETROLEUM PRODUCT DEMAND, NEWFOUNDLAND
(in MBbls.)

	1966	1975	1980	1985	1990
Motor Gasoline.....	1,792	3,040	3,930	4,960	6,130
Middle Distillates.....	4,829	7,040	7,900	8,940	10,120
Kerosene & stove oil..	1,184	1,130	1,110	1,100	1,070
Resid. & Comm..	1,127	1,060	1,020	990	950
Industrial.....	57	70	90	110	120
Diesel fuel.....	2,066	2,760	3,200	3,720	4,370
Resid. & Comm..	254	330	360	390	430
Industrial.....	509	790	1,010	1,290	1,650
Electric Ut'l.....	148	180	180	180	180
Transport.....	1,155	1,460	1,650	1,860	2,110
Light fuel.....	1,579	3,150	3,590	4,120	4,680
Resid. & Comm..	1,469	3,000	3,400	3,880	4,410
Industrial.....	110	150	190	240	270
Electric Ut'l.....	—	—	—	—	—
Heavy Fuel.....	2,789	6,340	12,450	8,680	11,740
Resid. & Comm..	630	890	1,100	1,330	1,620
Industrial.....	1,590	2,860	3,940	5,420	7,470
Electric Ut'l.....	414	2,400	7,200	1,700	2,400
Transport.....	155	190	210	230	250
Other Products.....	815	1,400	1,860	2,450	3,200
Aviation gasoline.....	97	70	50	40	40
Turbo fuel.....	450	940	1,340	1,840	2,470
Non-fuel products....	268	390	470	570	690
LPG.....	—	—	—	—	—
Total Product Demand	10,225	17,820	26,140	25,030	31,190

SOURCE: DBS Refined Petroleum Products, Vols. I & II.
DBS Crude Petroleum and Natural Gas Production.
DBS Electric Power Statistics, Vol. II.

TABLE 16

PETROLEUM PRODUCT DEMAND, MARITIME PROVINCES

(in MBbls.)

	1966	1975	1980	1985	1990
Motor Gasoline.....	8,490	11,750	13,390	14,680	15,780
Middle Distillates.....	12,939	16,920	19,120	20,870	22,490
Kerosene & stove oil..	2,743	2,530	2,450	2,360	2,270
Resid. & Comm..	2,674	2,410	2,290	2,170	2,040
Industrial.....	69	120	160	190	230
Diesel fuel.....	3,237	4,470	5,270	6,220	7,350
Resid. & Comm..	679	890	1,030	1,180	1,370
Industrial.....	279	410	480	550	620
Electric Ut'l.....	46	50	50	50	50
Transport.....	2,233	3,120	3,710	4,440	5,310
Light fuel.....	6,959	9,920	11,400	12,290	12,870
Resid. & Comm..	6,692	9,520	10,950	11,790	12,320
Industrial.....	249	360	410	460	510
Electric Ut'l.....	18	40	40	40	40
Heavy Fuel.....	10,022	17,610	24,010	32,020	35,460
Resid. & Comm..	2,447	3,480	4,240	5,150	6,280
Industrial.....	2,082	8,450	9,100	9,760	10,410
Electric Ut'l.....	2,889	2,540	7,200	13,280	14,570
Transport.....	2,604	3,140	3,470	3,830	4,200
Other Products.....	2,984	4,920	6,170	7,830	9,840
Aviation gasoline.....	269	190	150	120	100
Turbo fuel.....	688	1,540	2,220	3,070	4,130
Non-fuel products....	1,528	2,190	2,680	3,270	3,990
LPG.....	499	1,000	1,120	1,370	1,620
Total Product Demand	34,435	51,200	62,690	75,400	83,570

SOURCE: DBS Refined Petroleum Products, Vols. I & II.
DBS Crude Petroleum and Natural Gas Production.
DBS Electric Power Statistics, Vol. II.

TABLE 16

PETROLEUM PRODUCT DEMAND, QUEBEC

(in MBbls.)

	1966	1975	1980	1985	1990
Motor Gasoline.....	32,128	52,160	65,860	79,710	94,690
Middle Distillates.....	41,459	50,760	57,090	64,750	73,160
Kerosene & stove oil..	6,291	6,390	6,450	6,500	6,550
Resid. & Comm..	5,835	5,830	5,830	5,830	5,830
Industrial.....	456	560	620	670	720
Diesel fuel.....	7,544	10,800	13,240	16,350	19,980
Resid. & Comm..	842	1,200	1,460	1,770	2,160
Industrial.....	1,641	2,330	2,850	3,450	4,200
Electric Ut'l.....	65	70	70	70	70
Transport.....	4,996	7,200	8,860	11,060	13,550
Light fuel.....	27,624	33,570	37,400	41,900	46,630
Resid. & Comm..	25,146	30,580	34,100	38,030	42,400
Industrial.....	2,444	2,920	3,230	3,570	3,930
Electric Ut'l.....	34	70	70	300	300
Heavy Fuel.....	34,855	44,720	52,110	61,240	74,050
Resid. & Comm..	13,123	17,860	20,450	23,150	26,110
Industrial.....	16,354	20,130	24,250	28,170	31,450
Electric Ut'l.....	273	480	480	2,340	8,300
Transport.....	5,105	6,250	6,930	7,580	8,190
Other Products.....	15,668	28,290	39,980	57,150	82,400
Aviation gasoline.....	192	160	140	130	120
Turbo fuel.....	3,022	7,360	11,860	18,840	29,400
Non-fuel products....	10,851	18,300	25,020	34,730	48,930
LPG.....	1,603	2,470	2,960	3,450	3,950
Total Product Demand	124,110	175,930	215,040	262,850	324,300

SOURCE: DBS Refined Petroleum Products, Vols. I & II.
DBS Crude Petroleum and Natural Gas Production.
DBS Electric Power Statistics, Vol. II.

TABLE 16

PETROLEUM PRODUCT DEMAND, ONTARIO

(in MBbls.)

	1966	1975	1980	1985	1990
Motor Gasoline.....	50,043	72,940	87,060	104,040	124,610
Middle Distillates.....	44,068	47,510	49,840	52,280	56,210
Kerosene & stove oil..	3,701	3,420	3,280	3,140	3,020
Resid. & Comm..	3,222	2,940	2,800	2,660	2,540
Industrial.....	479	480	480	480	480
Diesel fuel.....	7,831	11,230	13,670	16,630	20,200
Resid. & Comm..	1,275	1,820	2,210	2,690	3,260
Industrial.....	1,817	2,590	3,140	3,830	4,650
Electric Ut'l.....	105	110	110	110	110
Transport.....	4,634	6,710	8,210	10,000	12,180
Light fuel.....	32,536	32,860	32,890	32,510	32,990
Resid. & Comm..	29,681	29,690	29,670	29,290	29,770
Industrial.....	2,771	2,760	2,760	2,760	2,760
Electric Ut'l.....	84	410	460	460	460
Heavy Fuel.....	23,429	28,410	33,480	40,740	50,880
Resid. & Comm..	10,201	10,140	9,880	9,650	9,410
Industrial.....	10,960	15,560	20,610	27,790	37,820
Electric Ut'l.....	—	—	—	—	—
Transport.....	2,268	2,710	2,990	3,300	3,650
Other Products.....	19,204	34,650	48,350	67,790	95,480
Aviation gasoline.....	263	220	200	180	160
Turbo fuel.....	2,808	7,140	11,760	19,090	30,170
Non-fuel products....	13,414	22,460	30,350	41,270	56,690
LPG.....	2,719	4,830	6,040	7,250	8,460
Total Product Demand..	136,744	183,510	218,730	264,850	327,180

SOURCE: DBS Refined Petroleum Products, Vols. I & II.
DBS Crude Petroleum and Natural Gas Production.
DBS Electric Power Statistics, Vol. II.

TABLE 16

PETROLEUM PRODUCT DEMAND, MANITOBA

(in MBbls.)

	1966	1975	1980	1985	1990
Motor Gasoline.....	6,876	9,270	10,470	11,650	12,500
Middle Distillates.....	5,701	5,590	5,580	5,650	6,150
Kerosene & stove oil..	1,049	880	790	710	620
Resid. & Comm..	963	790	700	620	530
Industrial.....	86	90	90	90	90
Diesel fuel.....	2,498	3,160	3,620	4,150	4,770
Resid. & Comm..	896	1,060	1,180	1,300	1,440
Industrial.....	272	330	360	390	430
Electric Ut'l.....	140	140	140	140	140
Transport.....	1,190	1,630	1,940	2,320	2,760
Light fuel.....	2,154	1,550	1,170	790	760
Resid. & Comm..	2,031	1,390	1,000	600	550
Industrial.....	105	140	150	170	190
Electric Ut'l.....	18	20	20	20	20
Heavy Fuel.....	980	1,300	1,270	1,260	1,140
Resid. & Comm..	536	410	350	290	220
Industrial.....	444	890	920	970	920
Electric Ut'l.....	—	—	—	—	—
Transport.....	—	—	—	—	—
Other Products.....	2,481	4,680	6,060	7,590	9,280
Aviation gasoline.....	180	150	140	120	110
Turbo fuel.....	888	1,760	2,450	3,290	4,280
Non-fuel products....	647	780	870	960	1,060
LPG.....	766	1,990	2,600	3,220	3,830
Total Product Demand..	16,038	20,840	23,380	26,150	29,070

SOURCE: DBS Refined Petroleum Products, Vols. I & II.
DBS Crude Petroleum and Natural Gas Production.
DBS Electric Power Statistics, Vol. II.

TABLE 16

PETROLEUM PRODUCT DEMAND, SASKATCHEWAN
(in MBbls.)

	1966	1975	1980	1985	1990
Motor Gasoline.....	9,542	12,520	14,080	15,690	17,000
Middle Distillates.....	6,884	7,350	7,690	8,160	8,770
Kerosene & stove oil..	1,465	1,180	1,040	900	760
Resid. & Comm..	1,370	1,090	950	810	670
Industrial.....	95	90	90	90	90
Diesel fuel.....	3,716	4,880	5,640	6,500	7,460
Resid. & Comm..	1,714	1,870	1,970	2,080	2,180
Industrial.....	597	1,030	1,270	1,510	1,750
Electric Ut'l.....	12	10	10	10	10
Transport.....	1,393	1,970	2,390	2,900	3,520
Light fuel.....	1,703	1,290	1,010	760	550
Resid. & Comm..	1,562	1,120	820	550	330
Industrial.....	141	170	190	210	220
Electric Ut'l.....	—	—	—	—	—
Heavy Fuel.....	641	570	540	510	480
Resid. & Comm..	294	220	190	160	130
Industrial.....	17	20	20	20	20
Electric Ut'l.....	330	330	330	330	330
Transport.....	—	—	—	—	—
Other Products.....	2,460	3,750	4,530	5,370	6,250
Aviation gasoline.....	52	50	50	40	40
Turbo fuel.....	293	510	650	810	970
Non-fuel products....	1,033	1,350	1,560	1,810	2,100
LPG.....	1,082	1,840	2,270	2,710	3,140
Total Product Demand..	19,527	24,190	26,840	29,730	32,500

SOURCE: DBS Refined Petroleum Products, Vols. I & II.
DBS Crude Petroleum and Natural Gas Production.
DBS Electric Power Statistics, Vol. II.

TABLE 16

PETROLEUM PRODUCT DEMAND, ALBERTA

(in MBbls.)

	1966	1975	1980	1985	1990
Motor Gasoline.....	13,763	18,850	21,830	24,990	28,540
Middle Distillates.....	6,811	8,930	10,500	12,460	14,770
Kerosene & stove oil..	459	470	470	470	470
Resid. & Comm..	362	360	360	360	360
Industrial.....	97	110	110	110	110
Diesel fuel.....	5,163	7,240	8,790	10,730	13,020
Resid. & Comm..	1,272	1,870	2,370	2,990	3,710
Industrial.....	1,402	1,770	2,010	2,280	2,570
Electric Ut'l.....	54	50	50	50	50
Transport.....	2,435	3,550	4,360	5,410	6,690
Light fuel.....	1,189	1,220	1,240	1,260	1,280
Resid. & Comm..	905	910	910	910	910
Industrial.....	246	270	290	310	330
Electric Ut'l.....	38	40	40	40	40
Heavy Fuel.....	779	1,000	1,220	1,640	2,140
Resid. & Comm..	390	390	390	390	390
Industrial.....	289	290	290	290	290
Electric Ut'l.....	100	320	540	960	1,460
Transport.....	—	—	—	—	—
Other Products.....	7,249	11,500	15,820	20,510	27,950
Aviation gasoline.....	204	170	150	140	130
Turbo fuel.....	966	2,190	3,320	4,930	7,140
Non-fuel products....	4,079	6,720	9,680	12,530	17,530
LPG.....	2,000	2,420	2,670	2,910	3,150
Total Product Demand..	28,602	40,280	49,370	59,600	73,400

SOURCE: DBS Refined Petroleum Products, Vols. I and II.
DBS Crude Petroleum and Natural Gas Production.
DBS Electric Power Statistics, Vol. II.

TABLE 16

PETROLEUM PRODUCT DEMAND, BRITISH COLUMBIA

(in MBbls.)

	1966	1975	1980	1985	1990
Motor Gasoline	13,349	21,020	25,840	31,320	37,500
Middle Distillates	12,722	14,370	15,420	16,690	18,140
Kerosene & stove oil	1,591	1,520	1,480	1,450	1,410
Resid. & Comm...	1,250	1,180	1,140	1,110	1,070
Industrial	341	340	340	340	340
Diesel fuel	6,271	8,580	10,210	12,200	14,600
Resid. & Comm...	480	650	740	820	910
Industrial	2,494	2,990	3,290	3,640	4,020
Electric Ut'l	317	320	320	320	320
Transport	2,980	4,620	5,860	7,420	9,350
Light fuel	4,860	4,270	3,730	3,040	2,130
Resid. & Comm...	4,463	3,810	3,230	2,510	1,560
Industrial	390	460	500	530	570
Electric Ut'l	7	—	—	—	—
Heavy Fuel	8,726	11,450	14,670	19,180	19,550
Resid. & Comm...	1,506	1,190	1,030	870	720
Industrial	5,221	8,170	10,390	13,110	16,480
Electric Ut'l	831	690	1,710	3,500	470
Transport	1,168	1,400	1,540	1,700	1,880
Other Products	4,321	7,100	9,540	12,970	17,700
Aviation gasoline	408	260	200	150	120
Turbo fuel	928	2,640	4,270	6,690	10,170
Non-fuel products	1,627	2,350	2,910	3,660	4,630
LPG	1,358	1,850	2,160	2,470	2,780
Total Product Demand	39,118	53,940	65,470	80,160	92,890

SOURCE: DBS Refined Petroleum Products, Vols. I & II.
DBS Crude Petroleum and Natural Gas Production.
DBS Electric Power Statistics, Vol. II.

TABLE 16

PETROLEUM PRODUCT DEMAND, YUKON AND N.W.T.
(in MBbls.)

	1966	1975	1980	1985	1990
Motor Gasoline.....	159	560	830	1,210	1,800
Middle Distillates.....	1,098	2,360	3,720	5,610	8,890
Kerosene & stove oil..	211	350	430	510	620
Resid. & Comm...	138	210	250	300	370
Industrial.....	73	140	180	210	250
Diesel fuel.....	521	1,440	2,610	4,270	7,310
Resid. & Comm...	119	170	220	260	330
Industrial.....	227	820	1,530	2,750	4,750
Electric Ut'l.....	52	200	510	760	1,510
Transport.....	123	250	350	500	720
Light fuel.....	366	570	680	830	960
Resid. & Comm...	244	380	460	570	670
Industrial.....	122	190	220	260	290
Electric Ut'l.....	—	—	—	—	—
Heavy Fuel.....	117	170	210	240	270
Resid. & Comm...	4	—	—	—	—
Industrial.....	105	170	210	240	270
Electric Ut'l.....	8	—	—	—	—
Transport.....	—	—	—	—	—
Other Products.....	165	500	870	1,470	2,370
Aviation gasoline.....	108	170	210	270	350
Turbo fuel.....	24	260	560	1,080	1,870
Non-fuel products....	15	50	70	90	110
LPG.....	18	20	30	30	40
Total Product Demand..	1,539	3,590	5,630	8,530	13,330

SOURCE: DBS Refined Petroleum Products, Vols. I & II.
DBS Crude Petroleum and Natural Gas Production.
DBS Electric Power Statistics, Vol. II.

TABLE 17A(1)

PETROLEUM DEMAND AND SUPPLY, CANADA
(in MB/D)

	1966	1975	1980	1985	1990
Motor Gasoline.....	372.9	553.7	666.5	789.7	927.5
Middle Distillates.....	373.2	440.6	484.7	535.4	599.2
Heavy Fuel.....	220.5	305.7	383.4	453.4	536.2
Other Products.....	155.2	265.2	364.9	501.7	697.4
Total Net Sales....	1,121.8	1,565.2	1,899.5	2,280.2	2,760.3
Own Use & Losses.....	81.0	112.7	136.6	164.0	198.6
Domestic Demand....	1,202.8	1,677.9	2,036.1	2,444.2	2,958.9
Export—Case (1).....	385.7	1,100.0	1,600.0	2,100.0	2,600.0
(2).....		1,100.0	1,600.0	1,319.2	1,668.3
(3).....		1,100.0	1,600.0	1,140.8	1,452.3
Import—Case (1).....	598.2	832.1	1,009.2	1,203.6	1,443.6
(2).....		503.4	352.2	422.8	511.9
(3).....		503.4	203.6	244.4	295.9
Production—Case					
(1).....	1,012.9	1,945.8	2,626.9	3,340.6	4,115.3
(2).....		2,274.5	3,283.9	3,340.6	4,115.3
(3).....		2,274.5	3,300.5	3,340.6	4,115.3
Inventory Change.....	+22.6	—	—	—	—

Case (1) Canadian imports continue as under present policy.
(2) Canada limits imports to 17.3 per cent of Canadian demand.
(3) Canada limits imports to 10 per cent of Canadian demand.

NOTE: This table is based on United States production rate peaking at 11 MMB/D in the 'lower 48' States.

TABLE 17A(2)

PETROLEUM DEMAND AND SUPPLY, CANADA
(in MB/D)

	1966	1975	1980	1985	1990
Motor Gasoline.....	372.9	553.7	666.5	789.7	927.5
Middle Distillates.....	373.2	440.6	484.7	535.4	599.2
Heavy Fuel.....	220.5	305.7	383.4	453.4	536.2
Other Products.....	155.2	265.2	364.9	501.7	697.4
Total Net Sales....	1,121.8	1,565.2	1,899.5	2,280.2	2,760.3
Own Use & Losses.....	81.0	112.7	136.6	164.0	198.6
Domestic Demand..	1,202.8	1,677.9	2,036.1	2,444.2	2,958.9
Export—Case (1).....	385.7	600.0	900.0	1,970.0	2,600.0
(2).....		600.0	900.0	1,189.2	1,668.3
(3).....		600.0	900.0	1,010.8	1,452.3
Import—Case (1).....	598.2	832.1	1,009.2	1,203.6	1,443.6
(2).....		503.4	352.2	422.8	511.9
(3).....		503.4	203.6	244.4	295.9
Production—Case					
(1).....	1,012.9	1,445.8	1,926.9	3,210.6	4,115.3
(2).....		1,774.5	2,583.9	3,210.6	4,115.3
(3).....		1,774.5	2,732.5	3,210.6	4,115.3
Inventory Change.....	+22.6	—	—	—	—

Case (1) Canadian imports continue as under present policy.
(2) Canada limits imports to 17.3 per cent of Canadian demand.
(3) Canada limits imports to 10 per cent of Canadian demand.

NOTE: This table is based on United States production rate peaking at 12 MMB/D in the 'lower 48' States.

TABLE 17B(1)

PETROLEUM DEMAND AND SUPPLY, CANADA
(in MB/D)

	1966	1975	1980	1985	1990
Motor Gasoline.....	372.9	553.7	666.5	789.7	927.5
Middle Distillates.....	373.2	440.6	484.7	535.4	599.2
Heavy Fuel.....	220.5	305.7	383.4	453.4	536.2
Other Products.....	155.2	265.2	364.9	501.7	697.4
Total Net Sales....	1,121.8	1,565.2	1,899.5	2,280.2	2,760.3
Own Use & Losses.....	81.0	112.7	136.6	164.0	198.6
Domestic Demand..	1,202.8	1,677.9	2,036.1	2,444.2	2,958.9
Export—Case (1).....	385.7	1,100.0	1,600.0	2,500.0	4,000.0
(2).....		1,100.0	1,600.0	2,500.0	4,000.0
(3).....		1,100.0	1,600.0	2,500.0	4,000.0
Import—Case (1).....	598.2	832.1	1,009.2	1,203.6	1,443.6
(2).....		503.4	352.2	422.8	511.9
(3).....		503.4	203.6	244.4	295.9
Production—Case					
(1).....	1,012.9	1,945.8	2,626.9	3,740.6	5,515.3
(2).....		2,274.5	3,283.9	4,521.4	6,447.0
(3).....		2,274.5	3,300.5	4,699.8	6,663.0
Inventory Change.....	+22.6	—	—	—	—

Case (1) Canadian imports continue as under present policy.
(2) Canada limits imports to 17.3 per cent of Canadian demand.
(3) Canada limits imports to 10 per cent of Canadian demand.

NOTE: This table is based on United States production rate peaking at 11 MMB/D in the 'lower 48' States.

TABLE 17B(2)

PETROLEUM DEMAND AND SUPPLY, CANADA
(in MB/D)

	1966	1975	1980	1985	1990
Motor Gasoline.....	372.9	553.7	666.5	789.7	927.5
Middle Distillates.....	373.2	440.6	484.7	535.4	599.2
Heavy Fuel.....	220.5	305.7	383.4	453.4	536.2
Other Products.....	155.2	265.2	364.9	501.7	697.4
Total Net Sales....	1,121.8	1,565.2	1,899.5	2,280.2	2,760.3
Own Use & Losses.....	81.0	122.7	136.6	164.0	198.6
Domestic Demand..	1,202.8	1,677.9	2,036.1	2,444.2	2,958.9
Export—Case (1).....	385.7	600.0	900.0	2,500.0	4,000.0
(2).....		600.0	900.0	2,500.0	4,000.0
(3).....		600.0	900.0	2,500.0	4,000.0
Import—Case (1).....	598.2	832.1	1,009.2	1,203.6	1,443.6
(2).....		503.4	352.2	422.8	511.9
(3).....		503.4	203.6	244.4	295.9
Production—Case					
(1).....	1,012.9	1,445.8	1,926.9	3,740.6	5,515.3
(2).....		1,774.5	2,583.9	4,521.4	6,447.0
(3).....		1,774.5	2,732.5	4,699.8	6,663.0
Inventory Change.....	+22.6	—	—	—	—

Case (1) Canadian imports continue as under present policy.
(2) Canada limits imports to 17.3 per cent of Canadian demand.
(3) Canada limits imports to 10 per cent of Canadian demand.

NOTE: This table is based on United States production rate peaking at 12 MMB/D in the 'lower 48' States.

TABLE 18A

NATURAL GAS DEMAND AND SUPPLY, CANADA

(in Bcf)

	1966	1975	1980	1985	1990
Resid. & Comm.....	311.0	529.6	668.1	824.3	992.4
Industrial.....	260.2	555.9	728.2	937.3	1,198.2
Electric Utilities.....	64.3	86.7	133.7	213.7	233.9
Total Net Sales....	635.5	1,172.2	1,530.0	1,975.3	2,424.5
Exports.....	431.8	1,165.4	1,358.6	1,449.3	1,626.1
Imports.....	44.6	44.6	44.6	44.6	44.6
Fuel & Losses.....	66.5	120.0	136.0	154.0	184.0
Required Production....	1,089.2	2,413.0	2,980.0	3,534.0	4,190.0
(MMcf/day)	2,980	6,600	8,150	9,670	11,500
Shrinkage.....	136.9	279.0	313.0	364.0	418.0
Field & Plant Use.....	98.2	205.0	238.0	282.0	334.0
Gross Production.....	1,341.8	2,897.0	3,531.0	4,180.0	4,942.0
Net Storage, etc.....	17.5	—	—	—	—

SOURCE: NEB Staff Estimate.

TABLE 18B

NATURAL GAS DEMAND AND SUPPLY, CANADA

(in Bcf)

	1966	1975	1980	1985	1990
Resid. & Comm.....	311.0	529.6	668.1	824.3	992.4
Industrial.....	260.2	555.9	728.2	937.3	1,198.2
Electric Utilities.....	64.3	86.7	133.7	213.7	233.9
Total Net Sales....	635.5	1,172.2	1,530.0	1,975.3	2,424.5
Exports.....	431.8	1,275.0	2,300.0	3,700.0	5,400.0
Imports.....	44.6	44.6	44.6	44.6	44.6
Fuel & Losses.....	66.5	122.4	172.6	255.3	352.1
Required Production....	1,089.2	2,525.0	3,958.0	5,886.0	8,132.0
(MMcf/day)	2,980	6,930	10,800	16,200	22,300
Shrinkage.....	136.9	281.0	400.0	589.0	813.0
Field & Plant Use.....	98.2	215.0	316.0	470.0	650.0
Gross Production.....	1,341.8	3,021.0	4,674.0	6,945.0	9,595.0
Net Storage, etc.....	17.5	—	—	—	—

SOURCE: NEB Staff Estimate.

TABLE 18

NATURAL GAS DEMAND

(in Bcf)

	1966	1975	1980	1985	1990
Canada					
Residential & Commercial	311.0	529.6	668.1	824.3	992.4
Industrial	260.2	555.9	728.2	937.3	1,198.2
Electric Utilities	64.3	86.7	133.7	213.7	233.9
Total Net Sales.	635.5	1,172.2	1,530.0	1,975.3	2,424.5
New Brunswick					
Residential & Commercial	0.1	0.1	0.1	—	—
Industrial	—	—	—	—	—
Electric Utilities	—	—	—	—	—
Total Net Sales.	0.1	0.1	0.1	—	—
Quebec					
Residential & Commercial	13.1	31.2	45.3	62.8	83.5
Industrial	19.4	67.2	85.6	111.2	148.0
Electric Utilities	—	—	—	—	—
Total Net Sales.	32.5	98.4	130.9	174.0	231.5
Ontario					
Residential & Commercial	124.0	232.8	304.0	387.7	476.1
Industrial	115.8	247.9	312.5	380.7	454.0
Electric Utilities	0.3	0.3	0.3	0.3	0.3
Total Net Sales.	240.1	481.0	616.8	768.7	930.4

SOURCE: NEB Staff Estimate.

TABLE 18

NATURAL GAS DEMAND

(in Bcf)

	1966	1975	1980	1985	1990
Manitoba					
Residential & Commercial	26.8	43.2	51.4	58.9	64.8
Industrial	10.6	20.8	27.5	35.3	45.2
Electric Utilities	0.2	0.2	0.2	0.2	0.2
Total Net Sales.	37.6	64.2	79.1	94.4	110.2
Saskatchewan					
Residential & Commercial	30.5	42.6	49.7	56.6	63.0
Industrial	21.7	46.0	59.5	73.0	86.5
Electric Utilities	12.8	20.0	20.0	20.0	20.0
Total Net Sales.	65.0	108.6	129.2	149.6	169.5
Alberta					
Residential & Commercial	87.3	121.9	141.6	161.0	182.6
Industrial	67.4	115.3	154.1	205.3	272.6
Electric Utilities	30.1	55.2	86.0	136.2	206.0
Total Net Sales.	184.8	292.4	381.7	502.5	661.2
British Columbia					
Residential & Commercial	29.2	57.8	76.0	97.3	122.4
Industrial	25.3	58.7	89.0	131.8	191.9
Electric Utilities	20.9	11.0	27.2	57.0	7.4
Total Net Sales.	75.4	127.5	192.2	286.1	321.7

SOURCE: NEB Staff Estimate.

TABLE 19

ESTIMATED INSTALLED GENERATING CAPACITIES
BY PROVINCE
(in MW)

	1966	1975	1980	1985	1990
Newfoundland (including Labrador)..	544	5,300	6,900	7,700	8,800
P.E.I.....	58	100	150	230	340
Nova Scotia.....	626	1,080	1,400	1,900	2,400
New Brunswick.....	679	1,220	1,700	2,400	3,300
Québec.....	10,566	13,000	17,200	24,200	33,300
Ontario.....	8,790	19,100	25,500	33,200	43,500
Manitoba.....	1,363	2,200	2,900	3,900	5,100
Saskatchewan.....	996	2,400	3,400	4,800	6,500
Alberta.....	1,491	3,300	4,900	7,200	10,500
British Columbia.....	3,741	7,200	9,900	13,800	18,800
Yukon and N.W.T.....	79	140	190	250	340
Total Canada	28,933	55,040	74,140	99,580	132,880

SOURCE: 1966 DBS Electric Power Statistics.

Estimated capacities for 1975 and later based on peak load estimates with allowances for reserve generation requirements.

TABLE 19

ELECTRICITY DEMAND AND SUPPLY, CANADA
(in GWH)

	1966	1975	1980	1985	1990
Resid. & Comm.	55,765	101,525	138,808	185,515	247,819
Industrial	88,234	146,259	189,874	246,021	318,581
Total Net Use	143,999	247,784	328,682	431,536	566,400
Exports	4,397	1,000	1,000	1,000	1,000
Imports	3,218	—	—	—	—
Losses & Unaccounted	12,957	22,449	29,908	39,394	51,900
Required Generation	158,135	271,233	359,590	471,930	619,300
Net Generation —					
Industries	32,137	33,836	34,730	35,636	36,725
Hydro	27,966	28,706	29,206	29,726	30,286
Thermal	4,171	5,130	5,524	5,910	6,439
Net Generation —					
Utilities	125,998	237,397	324,860	436,294	582,575
Hydro	101,868	162,640	186,244	228,018	247,443
Thermal	24,130	74,757	138,616	208,276	335,132
Nuclear	161	17,150	38,150	89,040	198,750
Oil	2,886	4,594	10,567	13,234	16,514
Natural Gas	5,229	5,980	9,436	15,344	16,258
Coal	15,854	47,033	80,463	90,658	103,610
Net Transfers	—	—	—	—	—
Fuel Use — Utilities					
Bituminous (M Tons)	5,069	13,052	21,747	21,635	21,615
Sub-bituminous (M Tons)	1,725	6,490	10,340	16,330	24,330
Lignite (M Tons)	1,085	3,661	8,220	11,269	13,853
Diesel fuel (MBbls)	939	1,130	1,436	1,681	2,436
Light fuel (MBbls)	200	564	633	866	866
Heavy fuel (MBbls)	4,845	6,753	17,452	22,107	27,522
Natural Gas (MMcf)	64,274	86,668	133,658	213,708	233,938
Uranium (Tons U_3O_8)	3	343	763	1,981	3,975

SOURCE: DBS Electric Power Statistics, Vol. II.

TABLE 19

ELECTRICITY DEMAND AND SUPPLY, NEWFOUNDLAND
(in GWH)

	1966	1975	1980	1985	1990
Resid. & Comm.	484	1,063	1,504	2,039	2,666
Industrial	2,238	5,447	7,496	10,024	13,418
Total Net Use	2,722	6,510	9,000	12,063	16,084
Exports	—	—	—	—	—
Imports	—	—	—	—	—
Losses & Unaccounted	121	290	400	537	816
Required Generation	2,843	6,800	9,400	12,600	16,900
Net Generation —					
Industries	557	480	480	480	480
Hydro	477	400	400	400	400
Thermal	80	80	80	80	80
Net Generation —					
Utilities	2,367	20,320	38,920	42,120	46,420
Hydro	2,127	18,918	34,918	41,118	45,028
Thermal	240	1,402	4,002	1,002	1,392
Nuclear	—	—	—	—	—
Oil	240	1,402	4,002	1,002	1,392
Natural Gas	—	—	—	—	—
Coal	—	—	—	—	—
Net Transfers	−81	−14,000	−30,000	−30,000	−30,000
Transfers In	—	—	—	—	—
Transfers Out	81	14,000	30,000	30,000	30,000
Fuel Use — Utilities					
Bituminous (M Tons)	—	—	—	—	—
Sub-bituminous (M Tons)	—	—	—	—	—
Lignite (M Tons)	—	—	—	—	—
Diesel fuel (MBbls)	148	184	184	184	184
Light fuel (MBbls)	—	—	—	—	—
Heavy fuel (MBbls)	414	2,400	7,200	1,700	2,400
Natural Gas (MMcf)	—	—	—	—	—
Uranium (Tons U_3O_8)	—	—	—	—	—

SOURCE: DBS Electric Power Statistics, Vol. II.

TABLE 19

ELECTRICITY DEMAND AND SUPPLY,
PRINCE EDWARD ISLAND
(in GWH)

	1966	1975	1980	1985	1990
Resid. & Comm.	121	240	326	436	570
Industrial	15	65	136	261	476
Total Net Use	136	305	462	697	1,046
Exports	—	—	—	—	—
Imports	—	—	—	—	—
Losses & Unaccounted	20	45	68	103	154
Required Generation	156	350	530	800	1,200
Net Generation — Industries	—	—	—	—	—
Hydro	—	—	—	—	—
Thermal	—	—	—	—	—
Net Generation — Utilities	156	350	530	800	1,200
Hydro	—	—	—	—	—
Thermal	156	350	530	800	1,200
Nuclear	—	—	—	—	—
Oil	156	350	530	800	1,200
Natural Gas	—	—	—	—	—
Coal	—	—	—	—	—
Net Transfers	—	—	—	—	—
Transfers In	—	—	—	—	—
Transfers Out	—	—	—	—	—
Fuel Use — Utilities					
Bituminous (M Tons)	—	—	—	—	—
Sub-bituminous (M Tons)	—	—	—	—	—
Lignite (M Tons)	—	—	—	—	—
Diesel fuel (MBbls)	1	1	1	1	1
Light fuel (MBbls)	—	—	—	—	—
Heavy fuel (MBbls)	372	640	970	1,470	2,200
Natural Gas (MMcf)	—	—	—	—	—
Uranium (Tons U_3O_8)	—	—	—	—	—

SOURCE: DBS Electric Power Statistics, Vol. II.

TABLE 19

ELECTRICITY DEMAND AND SUPPLY, NOVA SCOTIA
(in GWH)

	1966	1975	1980	1985	1990
Resid. & Comm.	1,295	2,399	3,097	3,991	5,040
Industrial	1,121	2,013	2,666	3,483	4,685
Total Net Use	2,416	4,412	5,763	7,474	9,725
Exports	—	—	—	—	—
Imports	—	—	—	—	—
Losses & Unaccounted	267	488	637	826	1,075
Required Generation	2,683	4,900	6,400	8,300	10,800
Net Generation—					
Industries	252	270	270	270	270
Hydro	23	40	40	40	40
Thermal	229	230	230	230	230
Net Generation—					
Utilities	2,620	4,084	6,130	8,030	10,530
Hydro	420	1,096	1,323	1,323	1,323
Thermal	2,200	2,988	4,807	6,707	9,207
Nuclear	—	—	—	—	3,300
Oil	428	1,024	1,024	1,024	1,024
Natural Gas	—	—	—	—	—
Coal	1,772	1,964	3,783	5,683	4,883
Net Transfers	−189	546	—	—	—
Transfers In	59	546	—	—	—
Transfers Out	248	—	—	—	—
Fuel Use—Utilities					
Bituminous (M Tons)	881	727	1,402	2,100	1,810
Sub-bituminous (M Tons)	—	—	—	—	—
Lignite (M Tons)	—	—	—	—	—
Diesel fuel (MBbls.)	28	28	28	28	28
Light fuel (MBbls.)	6	12	24	24	24
Heavy fuel (MBbls.)	831	1,175	1,175	1,175	1,175
Natural Gas (MMcf)	—	—	—	—	—
Uranium (Tons U_3O_8)	—	—	—	—	66

SOURCE: DBS Electric Power Statistics, Vol. II.

TABLE 19

ELECTRICITY DEMAND AND SUPPLY, NEW BRUNSWICK
(in GWH)

	1966	1975	1980	1985	1990
Resid. & Comm.	874	1,690	2,307	3,020	3,947
Industrial	2,149	3,654	5,040	6,904	9,412
Total Net Use	3,023	5,344	7,347	9,924	13,359
Exports	311	—	—	—	—
Imports	11	—	—	—	—
Losses & Unaccounted	145	256	353	476	641
Required Generation	3,468	5,600	7,700	10,400	14,000
Net Generation—					
Industries	637	650	650	650	650
Hydro	62	50	50	50	50
Thermal	575	600	600	600	600
Net Generation—					
Utilities	2,583	3,526	6,050	9,750	13,350
Hydro	1,127	2,576	2,732	3,388	3,388
Thermal	1,456	950	3,318	6,362	9,962
Nuclear	—	—	—	—	3,300
Oil	872	400	2,768	5,812	6,112
Natural Gas	—	—	—	—	—
Coal	584	550	550	550	550
Net Transfers	248	1,424	1,000	—	—
Transfers In	307	1,970	1,000	—	—
Transfers Out	59	546	—	—	—
Fuel Use—Utilities					
Bituminous (M Tons)	324	305	305	305	305
Sub-bituminous (M Tons)	—	—	—	—	—
Lignite (M Tons)	—	—	—	—	—
Diesel fuel (MBbls.)	17	17	17	17	17
Light fuel (MBbls.)	12	24	24	24	24
Heavy fuel (MBbls.)	1,686	717	5,050	10,630	11,190
Natural Gas (MMcf)	—	—	—	—	—
Uranium (Tons U_3O_8)	—	—	—	—	66

SOURCE: DBS Electric Power Statistics, Vol. II.

TABLE 19

ELECTRICITY DEMAND AND SUPPLY, QUEBEC
(in GWH)

	1966	1975	1980	1985	1990
Resid. & Comm.	15,765	28,402	38,907	51,943	69,743
Industrial	36,560	53,887	66,497	82,124	101,308
Total Net Use	52,325	82,289	105,404	134,067	171,051
Exports	26	—	—	—	—
Imports	1	—	—	—	—
Losses & Unaccounted	4,268	6,711	8,596	10,933	13,949
Required Generation	56,618	89,000	114,000	145,000	185,000
Net Generation—					
Industries	17,082	17,000	17,000	17,000	17,000
Hydro	16,700	16,700	16,700	16,700	16,700
Thermal	382	300	300	300	300
Net Generation—					
Utilities	45,660	65,071	70,361	98,490	138,490
Hydro	45,500	63,026	68,316	90,216	90,216
Thermal	160	2,045	2,045	8,274	48,274
Nuclear	—	1,750	1,750	7,000	43,750
Oil	160	295	295	1,274	4,524
Natural Gas	—	—	—	—	—
Coal	—	—	—	—	—
Net Transfers	−6,124	6,929	26,639	29,510	29,510
Transfers In	172	14,000	30,000	30,000	30,000
Transfers Out	6,296	7,071	3,361	490	490
Fuel Use—Utilities					
Bituminous (M Tons)	—	—	—	—	—
Sub-bituminous (M Tons)	—	—	—	—	—
Lignite (M Tons)	—	—	—	—	—
Diesel fuel (MBbls.)	65	65	65	65	65
Light fuel (MBbls.)	35	67	67	300	300
Heavy fuel (MBbls.)	273	482	482	2,340	8,300
Natural Gas (MMcf)	—	—	—	—	—
Uranium (Tons U_3O_8)	—	35	35	140	875

SOURCE: DBS Electric Power Statistics, Vol. II.

TABLE 19

ELECTRICITY DEMAND AND SUPPLY, ONTARIO
(in GWH)

	1966	1975	1980	1985	1990
Resid. & Comm.	23,053	42,162	58,226	77,916	104,421
Industrial	25,479	40,794	52,683	67,258	85,838
Total Net Use	48,532	82,956	110,909	145,174	190,259
Exports	3,247	1,000	1,000	1,000	1,000
Imports	2,339	—	—	—	—
Losses & Unaccounted	5,292	9,044	12,091	15,826	20,741
Required Generation	54,732	93,000	124,000	162,000	212,000
Net Generation—					
Industries	2,726	2,800	2,800	2,800	2,800
Hydro	1,615	1,600	1,600	1,600	1,600
Thermal	1,111	1,200	1,200	1,200	1,200
Net Generation—					
Utilities	45,857	83,699	118,839	158,710	208,710
Hydro	35,384	35,760	35,760	35,760	35,760
Thermal	10,473	47,939	83,079	122,950	172,950
Nuclear	161	15,400	36,400	78,400	141,400
Oil	62	88	88	88	88
Natural Gas	34	34	34	34	34
Coal	10,216	32,417	46,557	44,428	31,428
Net Transfers	6,149	6,501	2,361	490	490
Transfers In	6,272	6,501	2,361	490	490
Transfers Out	123	—	—	—	—
Fuel Use—Utilities					
Bituminous (M Tons)	3,858	12,020	17,260	16,450	11,640
Sub-bituminous (M Tons)	—	—	—	—	—
Lignite (M Tons)	—	—	—	—	—
Diesel fuel (MBbls.)	105	105	105	105	105
Light fuel (MBbls.)	84	411	457	457	457
Heavy fuel (MBbls.)	—	—	—	—	—
Natural Gas (MMcf)	333	333	333	333	333
Uranium (Tons U_3O_8)	3	308	728	1,568	2,828

SOURCE: DBS Electric Power Statistics, Vol. II.

TABLE 19

ELECTRICITY DEMAND AND SUPPLY, MANITOBA
(in GWH)

	1966	1975	1980	1985	1990
Resid. & Comm.	3,463	5,531	7,180	9,267	11,784
Industrial	2,456	4,179	5,617	7,553	10,154
Total Net Use	5,919	9,710	12,797	16,820	21,938
Exports	—	—	—	—	—
Imports	—	—	—	—	—
Losses & Unaccounted	556	913	1,203	1,580	2,062
Required Generation	6,475	10,623	14,000	18,400	24,000
Net Generation—					
Industries	68	79	79	79	79
Hydro	60	60	60	60	60
Thermal	8	19	19	19	19
Net Generation—					
Utilities	6,102	11,304	13,281	17,681	23,281
Hydro	5,977	11,164	11,166	15,966	22,966
Thermal	125	140	2,115	1,715	315
Nuclear	—	—	—	—	—
Oil	52	52	52	52	52
Natural Gas	9	9	9	9	9
Coal	64	79	2,054	1,654	254
Net Transfers	305	—760	640	640	640
Transfers In	647	640	640	640	640
Transfers Out	342	1,400	—	—	—
Fuel Use—Utilities					
Bituminous (M Tons)	—	—	—	—	—
Sub-bituminous (M Tons)	—	—	—	—	—
Lignite (M Tons)	87	79	2,054	1,654	254
Diesel fuel (MBbls.)	140	140	140	140	140
Light fuel (MBbls.)	18	12	23	23	23
Heavy fuel (MBbls.)	—	—	—	—	—
Natural Gas (MMcf)	175	175	175	175	175
Uranium (Tons U_3O_8)	—	—	—	—	—

SOURCE: DBS Electric Power Statistics, Vol. II.

TABLE 19

ELECTRICITY DEMAND AND SUPPLY, SASKATCHEWAN
(in GWH)

	1966	1975	1980	1985	1990
Resid. & Comm.	2,026	3,376	4,320	5,530	7,064
Industrial	1,075	4,217	6,600	9,826	13,400
Total Net Use	3,101	7,593	10,920	15,356	20,464
Exports	—	—	—	—	—
Imports	1	—	—	—	—
Losses & Unaccounted	534	1,307	1,880	2,644	3,536
Required Generation	3,634	8,900	12,800	18,000	24,000
Net Generation—					
Industries	190	227	251	277	306
Hydro	81	80	80	80	80
Thermal	109	147	171	197	226
Net Generation—					
Utilities	3,752	9,313	13,189	18,363	24,334
Hydro	1,605	2,600	2,600	2,600	2,600
Thermal	2,147	6,713	10,589	15,763	21,734
Nuclear	—	—	—	—	—
Oil	140	140	140	140	140
Natural Gas	841	1,200	1,200	1,200	1,200
Coal	1,166	5,373	9,249	14,423	20,394
Net Transfers	−308	−640	−640	−640	−640
Transfers In	306	—	—	—	—
Transfers Out	614	640	640	640	640
Fuel Use—Utilities					
Bituminous (M Tons)	—	—	—	—	—
Sub-bituminous (M Tons)	232	1,380	2,370	3,700	5,230
Lignite (M Tons)	998	3,582	6,166	9,615	13,599
Diesel fuel (MBbls.)	12	12	12	12	12
Light fuel (MBbls.)	—	—	—	—	—
Heavy fuel (MBbls.)	330	330	330	330	330
Natural Gas (MMcf)	12,829	20,000	20,000	20,000	20,000
Uranium (Tons U_3O_8)	—	—	—	—	—

SOURCE: DBS Electric Power Statistics, Vol. II.

TABLE 19

ELECTRICITY DEMAND AND SUPPLY, ALBERTA
(in GWH)

	1966	1975	1980	1985	1990
Resid. & Comm.	3,343	6,146	8,541	11,764	15,876
Industrial	2,219	6,142	9,529	14,799	22,984
Total Net Use	5,562	12,288	18,070	26,563	38,860
Exports	—	—	—	—	—
Imports	1	—	—	—	—
Losses & Unaccounted	594	1,312	1,930	2,837	4,140
Required Generation	6,155	13,600	20,000	29,400	43,000
Net Generation—					
Industries	410	1,000	1,000	1,000	1,000
Hydro	—	—	—	—	—
Thermal	410	1,000	1,000	1,000	1,000
Net Generation—					
Utilities	5,739	12,600	19,000	28,400	42,000
Hydro	1,425	1,880	1,880	1,880	1,880
Thermal	4,314	10,720	17,770	26,520	40,120
Nuclear	—	—	—	—	—
Oil	91	210	330	560	830
Natural Gas	2,171	3,860	6,020	9,540	14,420
Coal	2,052	6,650	10,770	16,420	24,870
Net Transfers	6	—	—	—	—
Transfers In	6	—	—	—	—
Transfers Out	—	—	—	—	—
Fuel Use—Utilities					
Bituminous (M Tons)	6	—	—	—	—
Sub-bituminous (M Tons)	1,493	5,110	7,970	12,630	19,100
Lignite (M Tons)	—	—	—	—	—
Diesel fuel (MBbls.)	54	54	54	54	54
Light fuel (MBbls.)	38	38	38	38	38
Heavy fuel (MBbls.)	100	321	540	962	1,460
Natural Gas (MMcf)	30,060	55,200	86,000	136,200	206,000
Uranium (Tons U_3O_8)	—	—	—	—	—

SOURCE: DBS Electric Power Statistics, Vol. II.

TABLE 19

ELECTRICITY DEMAND AND SUPPLY, BRITISH COLUMBIA
(in GWH)

	1966	1975	1980	1985	1990
Resid. & Comm.	5,225	10,300	14,099	19,241	26,125
Industrial	14,736	25,550	33,196	43,188	56,168
Total Net Use	19,961	35,850	47,295	62,429	82,295
Exports	813	—	—	—	—
Imports	865	—	—	—	—
Losses & Unaccounted	1,141	2,050	2,705	3,571	4,707
Required Generation	21,050	37,900	50,000	66,000	87,000
Net Generation—					
Industries	10,155	11,270	12,140	13,020	14,080
Hydro	8,902	9,730	10,230	10,750	11,310
Thermal	1,253	1,540	1,910	2,270	2,770
Net Generation—					
Utilities	10,901	26,630	37,860	52,980	72,920
Hydro	8,079	25,220	27,099	35,167	43,682
Thermal	2,822	1,410	10,761	17,813	29,238
Nuclear	—	—	—	3,640	7,000
Oil	648	533	1,088	2,112	412
Natural Gas	2,174	877	2,173	4,561	595
Coal	—	—	7,500	7,500	21,231
Net Transfers	−6	—	—	—	—
Transfers In	—	—	—	—	—
Transfers Out	6	—	—	—	—
Fuel Use—Utilities					
Bituminous (M Tons)	—	—	2,780	2,780	7,860
Sub-bituminous (M Tons)	—	—	—	—	—
Lignite (M Tons)	—	—	—	—	—
Diesel fuel (MBbls.)	317	320	320	320	320
Light fuel (MBbls.)	7	—	—	—	—
Heavy fuel (MBbls.)	831	688	1,705	3,500	467
Natural Gas (MMcf)	20,877	10,960	27,150	57,000	7,430
Uranium (Tons U_3O_8)	—	—	—	73	140

SOURCE: DBS Electric Power Statistics, Vol. II.

TABLE 19

ELECTRICITY DEMAND AND SUPPLY, YUKON AND N.W.T.
(in GWH)

	1966	1975	1980	1985	1990
Resid. & Comm.	116	216	301	418	583
Industrial	186	311	414	551	738
Total Net Use	302	527	715	969	1,321
Exports	—	—	—	—	—
Imports	—	—	—	—	—
Losses & Unaccounted	19	33	45	61	79
Required Generation	321	560	760	1,030	1,400
Net Generation—					
Industries	60	60	60	60	60
Hydro	46	46	46	46	46
Thermal	14	14	14	14	14
Net Generation—					
Utilities	261	500	700	970	1,340
Hydro	224	400	450	600	600
Thermal	37	100	250	370	740
Nuclear	—	—	—	—	—
Oil	37	100	250	370	740
Natural Gas	—	—	—	—	—
Coal	—	—	—	—	—
Net Transfers	—	—	—	—	—
Transfers In	—	—	—	—	—
Transfers Out	—	—	—	—	—
Fuel Use—Utilities					
Bituminous (M Tons)	—	—	—	—	—
Sub-bituminous (M Tons)	—	—	—	—	—
Lignite (M Tons)	—	—	—	—	—
Diesel fuel (MBbls.)	52	204	510	755	1,510
Light fuel (MBbls.)	—	—	—	—	—
Heavy fuel (MBbls.)	8	—	—	—	—
Natural Gas (MMcf)	—	—	—	—	—
Uranium (Tons U_3O_8)	—	—	—	—	—

SOURCE: DBS Electric Power Statistics, Vol. II.

TABLE 20

COAL AND COKE DEMAND AND SUPPLY, CANADA
(in M Tons)

	1966	1975	1980	1985	1990
Residential & Commercial	2,704	1,038	451	176	—
Industrial	14,073	13,175	13,605	14,195	14,855
Transport	622	180	80	—	—
Electric Utilities	7,879	23,203	40,307	49,234	59,798
Losses & Unaccounted	721	—	—	—	—
Domestic Demand	25,999	37,596	54,443	63,605	74,653
Exports	1,315	11,400	13,900	17,000	20,500
Imports	16,884	22,398	28,154	28,175	23,874
Required Production	10,430	26,598	40,189	52,430	71,279
Production	11,392	26,598	40,189	52,430	71,279
Bituminous	6,726	15,620	21,010	24,240	32,485
Sub-bituminous	2,588	6,963	10,683	16,675	24,715
Lignite	2,078	4,015	8,496	11,515	14,079
Transfers	—	—	—	—	—
Bituminous	—	—	—	—	—
Sub-bituminous	—	—	—	—	—
Lignite	—	—	—	—	—
Inventory Change	962	—	—	—	—

SOURCE: DBS, Energy Statistics Section.
DBS, The Coal Mining Industry.

TABLE 20

COAL AND COKE DEMAND AND SUPPLY, NEWFOUNDLAND

(in M Tons)

	1966	1975	1980	1985	1990
Residential & Commercial	53	—	—	—	—
Industrial	—	—	—	—	—
Transport	1	—	—	—	—
Electric Utilities	—	—	—	—	—
Losses & Unaccounted	14	—	—	—	—
Domestic Demand	68	—	—	—	—
Exports	—	—	—	—	—
Imports	10	—	—	—	—
Required Production	58	—	—	—	—
Production	—	—	—	—	—
Bituminous	—	—	—	—	—
Sub-bituminous	—	—	—	—	—
Lignite	—	—	—	—	—
Net Transfers	47	—	—	—	—
Bituminous	47	—	—	—	—
Sub-bituminous	—	—	—	—	—
Lignite	—	—	—	—	—
Inventory Change	−11	—	—	—	—

SOURCE: DBS, Energy Statistics Section.
DBS, The Coal Mining Industry.

TABLE 20

COAL AND COKE DEMAND AND SUPPLY, MARITIME PROVINCES

(in M Tons)

	1966	1975	1980	1985	1990
Residential & Commercial	445	168	31	—	—
Industrial	1,189	880	880	880	880
Transport	20	—	—	—	—
Electric Utilities	1,205	1,032	1,707	2,405	2,115
Losses & Unaccounted	47	—	—	—	—
Domestic Demand	2,906	2,080	2,618	3,285	2,995
Exports	153	—	—	—	—
Imports	503	—	—	—	—
Required Production	2,556	2,080	2,618	3,285	2,995
Production	4,753	3,500	3,500	3,500	2,995
Bituminous	4,753	3,500	3,500	3,500	2,995
Nova Scotia	3,855	3,000	3,000	3,000	2,690
New Brunswick	898	500	500	500	305
Net Transfers	−2,193	−1,420	−882	−215	—
Bituminous	−2,193	−1,420	−882	−215	—
Sub-bituminous	—	—	—	—	—
Lignite	—	—	—	—	—
Inventory Change	4	—	—	—	—

SOURCE: DBS, Energy Statistics Section.
DBS, The Coal Mining Industry.

TABLE 20

COAL AND COKE DEMAND AND SUPPLY, QUEBEC

(in M Tons)

	1966	1975	1980	1985	1990
Residential & Commercial	272	42	—	—	—
Industrial	2,045	1,590	1,340	1,090	840
Transport	44	—	—	—	—
Electric Utilities	—	—	—	—	—
Losses & Unaccounted	−212	—	—	—	—
Domestic Demand	2,149	1,632	1,340	1,090	840
Exports	—	—	—	—	—
Imports	981	900	900	875	840
Required Production	1,168	732	440	215	—
Production	—	—	—	—	—
Bituminous	—	—	—	—	—
Sub-bituminous	—	—	—	—	—
Lignite	—	—	—	—	—
Net Transfers	1,187	732	440	215	—
Bituminous	1,187	732	440	215	—
Sub-bitumunous	—	—	—	—	—
Lignite	—	—	—	—	—
Inventory Change	19	—	—	—	—

SOURCE: DBS, Energy Statistics Section.
DBS, The Coal Mining Industry.

TABLE 20

COAL AND COKE DEMAND AND SUPPLY, ONTARIO

(in M Tons)

	1966	1975	1980	1985	1990
Residential & Commercial	991	592	382	176	—
Industrial	10,026	9,620	10,200	10,900	11,620
Transport	424	180	80	—	—
Electric Utilities	3,858	12,020	17,260	16,450	11,640
Losses & Unaccounted	353	—	—	—	—
Domestic Demand	15,652	22,412	27,922	27,526	23,260
Exports	1	—	—	—	—
Imports	15,377	21,498	27,254	27,300	23,034
Required Production	276	914	668	226	226
Production	—	—	—	—	—
Bituminous	—	—	—	—	—
Sub-bituminous	—	—	—	—	—
Lignite	—	—	—	—	—
Net Transfers	1,235	914	668	226	226
Bituminous	1,005	688	442	—	—
Sub-bituminous	4	—	—	—	—
Lignite	226	226	226	226	226
Inventory Change	959	—	—	—	—

SOURCE: DBS, Energy Statistics Section.
DBS, The Coal Mining Industry.

TABLE 20

COAL AND COKE DEMAND AND SUPPLY, MANITOBA

(in M Tons)

	1966	1975	1980	1985	1990
Residential & Commercial	217	38	—	—	—
Industrial	367	290	250	220	200
Transport	118	—	—	—	—
Electric Utilities	87	79	2,054	1,654	254
Losses & Unaccounted	−12	—	—	—	—
Domestic Demand	777	407	2,304	1,874	454
Exports	—	—	—	—	—
Imports	6	—	—	—	—
Required Production	771	407	2,304	1,874	454
Production	—	—	—	—	—
Bituminous	—	—	—	—	—
Sub-bituminous	—	—	—	—	—
Lignite	—	—	—	—	—
Net Transfers	769	407	2,304	1,874	454
Bituminous	139	100	100	100	100
Sub-bituminous	114	100	100	100	100
Lignite	516	207	2,104	1,674	254
Inventory Change	2	—	—	—	—

SOURCE: DBS, Energy Statistics Section.
DBS, The Coal Mining Industry.

TABLE 20

COAL AND COKE DEMAND AND SUPPLY, SASKATCHEWAN

(in M Tons)

	1966	1975	1980	1985	1990
Residential & Commercial	123	53	15	—	—
Industrial	127	65	65	65	65
Transport	10	—	—	—	—
Electric Utilities	1,230	4,962	8,536	13,315	18,829
Losses & Unaccounted	219	—	—	—	—
Domestic Demand	1,709	5,080	8,616	13,380	18,894
Exports	1	—	—	—	—
Imports	2	—	—	—	—
Required Production	1,708	5,080	8,616	13,380	18,894
Production	2,078	4,015	8,496	11,515	14,079
Bituminous	—	—	—	—	—
Sub-bituminous	—	—	—	—	—
Lignite	2,078	4,015	8,496	11,515	14,079
Net Transfers	−365	1,065	120	1,865	4,815
Bituminous	—	—	—	—	—
Sub-bituminous	377	1,498	2,450	3,765	5,295
Lignite	−742	−433	−2,330	−1,900	−480
Inventory Change	5	—	—	—	—

SOURCE: DBS, Energy Statistics Section.
DBS, The Coal Mining Industry.

TABLE 20

COAL AND COKE DEMAND AND SUPPLY, ALBERTA
(in M Tons)

	1966	1975	1980	1985	1990
Residential & Commercial	483	145	23	—	—
Industrial	50	210	240	280	320
Transport	2	—	—	—	—
Electric Utilities	1,499	5,110	7,970	12,630	19,100
Losses & Unaccounted	8	—	—	—	—
Domestic Demand	2,042	5,465	8,233	12,910	19,420
Exports	8	—	—	—	—
Imports	—	—	—	—	—
Required Production	2,050	5,465	8,233	12,910	19,420
Production	3,467	11,563	15,783	22,875	32,415
Bituminous	880	4,600	5,100	6,200	7,700
Sub-bituminous	2,587	6,963	10,683	16,675	24,715
Lignite	—	—	—	—	—
Net Transfers	−1,436	−6,098	−7,550	−9,965	−12,995
Bituminous	−846	−4,500	−5,000	−6,100	−7,600
Sub-bituminous	−590	−1,598	−2,550	−3,865	−5,395
Lignite	—	—	—	—	—
Inventory Change	−19	—	—	—	—

SOURCE: DBS, Energy Statistics Section.
DBS, The Coal Mining Industry.

TABLE 20

COAL AND COKE DEMAND AND SUPPLY, BRITISH COLUMBIA & YUKON
(in M Tons)

	1966	1975	1980	1985	1990
Residential & Commercial	120	—	—	—	—
Industrial	269	520	630	760	930
Transport	3	—	—	—	—
Electric Utilities	—	—	2,780	2,780	7,860
Losses & Unaccounted	304	—	—	—	—
Domestic Demand	696	520	3,410	3,540	8,790
Exports	1,152	11,400	13,900	17,000	20,500
Imports	5	—	—	—	—
Required Production	1,843	11,920	17,310	20,540	29,290
Production	1,094	7,520	12,410	14,540	21,790
Bituminous	1,094	7,520	12,410	14,540	21,790
Sub-bituminous	—	—	—	—	—
Lignite	—	—	—	—	—
Net Transfers	756	4,400	4,900	6,000	7,500
Bituminous	661	4,400	4,900	6,000	7,500
Sub-bituminous	95	—	—	—	—
Lignite	—	—	—	—	—
Inventory Change	7	—	—	—	—

SOURCE: DBS, Energy Statistics Section.
DBS, The Coal Mining Industry.

TABLE 21

PRIMARY ENERGY REQUIREMENTS

(in Btu 10^{12})

	1966	1975	1980	1985	1990
Petroleum Fuels.....	2,331	3,137	3,764	4,454	5,299
Natural Gas.....	828	1,497	1,904	2,411	2,943
Coal and Coke.....	636	886	1,246	1,406	1,606
Hydro—Electricity*....	1,288	1,918	2,161	2,587	2,788
Nuclear*.....	**	183	406	948	2,117
Total.....	5,083	7,621	9,481	11,806	14,753

*Input equivalent of 10,000 Btu's per kwh.
**Less than 0.5 Btu 10^{12}.
SOURCE: NEB Staff Estimate.

TABLE 22

PRIMARY ENERGY REQUIREMENTS

(in Percentages)

	1966	1975	1980	1985	1990
Petroleum Fuels.....	45.9	41.2	39.7	37.7	35.9
Natural Gas.....	16.3	19.6	20.1	20.4	20.0
Coal and Coke.....	12.5	11.6	13.1	11.9	10.9
Hydro—Electricity.....	25.3	25.2	22.8	21.9	18.9
Nuclear.....	—	2.4	4.3	8.1	14.3
Total.....	100.0	100.0	100.0	100.0	100.0

SOURCE: NEB Staff Estimate.